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# MONTANA

Fish and Game Commission

## QUARTERLY REPORT

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January - March 1952

*Wildlife Restoration Division*

PITTMAN-ROBERTSON FEDERAL AID PROJECT

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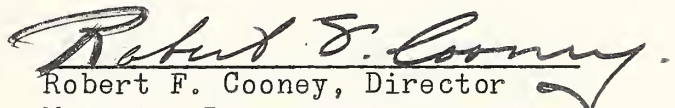
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Dear Sir:

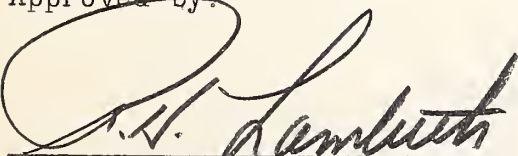
We are herewith submitting a Quarterly Progress Report in connection with the projects carried out through the use of Federal Aid in Wildlife Restoration funds.

The coverage is for the period January, February and March, 1952.

Submitted by:

  
Robert F. Cooney, Director  
Wildlife Restoration Division

Approved by:

  
R. H. Lambeth  
State Fish and Game Warden



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QUARTERLY PROGRESS REPORT  
For The  
WILDLIFE RESTORATION DIVISION  
STATE OF MONTANA

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Volume III      Number I  
January, February and March, 1952





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| STATE       | Montana          |
| PROJECT NO. | 1-R-11 (Eastern) |
| DATE        | March 31, 1952   |
| VOL.        | III No. I        |

QUARTERLY PROGRESS REPORT FOR  
INVESTIGATIONS PROJECTS

As Required By

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Wildlife Survey and Management (Eastern)
2. Leader: Don L. Brown, Biologist
3. Report of Progress:

Work Plan I: Antelope Census, Herd Production, Migration and Mortality Studies

Job I-A: Antelope Census  
Annual job completion report attached.

Job I-B: Antelope Herd Production Studies  
Annual job completion report attached.

Job I-C: Study of Antelope Migration and Population Shifts  
Annual job completion report attached.

Job I-D: Study of Antelope Losses by Hunting and Natural Causes  
Annual job completion report attached.

Work Plan II: Relationship of Antelope to Agricultural and Range Land Use

Job II-A: Relationship of Antelope to Winter Wheat Production  
Proceeding according to schedule.

Job II-B: Relationship of Antelope to Seed and Feed Alfalfa  
Proceeding according to schedule.

Work Plan III: Deer Food Habits Study on Badland Type Range

Job III-A: Important Food Plants Used by Deer in Badlands  
Inactive during report period.

Job III-B: Evaluation of Range Conditions and Degree of Use in Key Species  
Inactive during report period.

Job III-C: Population Studies of Deer (Missouri River Breaks)  
Annual job completion report attached.

Work Plan IV: Mule Deer Food Habits on Grassland Type Range

Job IV-A: Mule Deer Food Habits on Grassland Type Range  
Inactive during report period.

Job IV-B: Population Studies (Little Belt Mountains)  
Annual job completion report attached.

Work Plan V: Census and Survey of Deer Herds in Eastern Montana  
Inactive during report period.

Work Plan VI: Study of Introduced Mountain Sheep Herd in Badlands  
Inactive during report period.

Job VII-A: Census and Survey of Established Elk Herds  
Annual job completion reports pending.

Job VII-B: Investigation of Recently Introduced Elk Herds.  
1. Missouri River Breaks. Job completion report  
pending.  
2. Pine Ridge. Job completion report pending.  
3. Rock Creek. Inactive during report period.  
4. Knowlton. Inactive during report period.

Submitted by:

Name Don L. Brown

Title Biologist

Approved by:

Montana State Department of Fish & Game

By Robert F. Cooney, Director

Title Wildlife Restoration Division

Date April 15, 1952

JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 1-R (Eastern) Work Plan No. I Job No. I A-D

Title of Job: Summer Aerial Antelope Survey (Yellowstone Unit)

DATES:

July 7, 16-25, 1951

PERSONNEL:

Raleigh Shields, Deputy Game Warden  
Harold Demaree, Fieldman  
Donald E. Johnson, Jr. Biologist  
Don L. Brown, Biologist

OBJECTIVES:

1. To furnish reliable management data.
2. To improve census techniques.
3. To determine natural loss and annual increase percentages.

TECHNIQUES USED:

This survey was conducted in the same manner and over the same area as the census of 1949. (Summer Aerial Antelope Census, Quarterly Progress Report, Jan-Mar. 1950).

Areas I and II were omitted from census because of their large size and low antelope density (716 square miles - 111 antelope, 1949).

A new area (XVIII, see map) was censused on the erroneous report that many antelope had migrated into this sub-unit.

FINDINGS:

Figure 1 shows unit and subunit boundaries and populations by subunits as determined for census years.

Yellowstone Big Game Management Unit

Aerial Antelope Census

| Area Number | 1948 | 1949  | 1950 | 1951  |
|-------------|------|-------|------|-------|
| 1           |      | 38    |      |       |
| 2           |      | 73    |      |       |
| 3           |      | 399   |      | 770   |
| 4           |      | 309   |      | 565   |
| 5           |      | 2028  |      | 1596  |
| 6           |      | 725   |      | 1092  |
| 7           |      | 460   |      | 493   |
| 8           |      | 231   |      | 218   |
| 9           |      | 475   |      | 444   |
| 10          |      | 362   |      | 630   |
| 11          |      | 634   |      | 892   |
| 12          |      | 630   |      | 633   |
| 13          | 395  | 543   | 439  | 407   |
| 14          | 185  | 244   | 177  | 173   |
| 15          | 282  | 277   | 269  | 268   |
| 16          | 138  | 178   | 147  | 169   |
| 17          | 172  | 288   | 469  | 507   |
| 18          |      |       |      | 28    |
| 19          | 303  | 523   | 621  | 767   |
| 20          | 77   | 46    | 128  | 227   |
| 21          | 1475 | 1427  | 1698 | 1799  |
| 22          | 138  | 294   | 266  | 182   |
| Totals      | 3165 | 10184 | 4214 | 11860 |



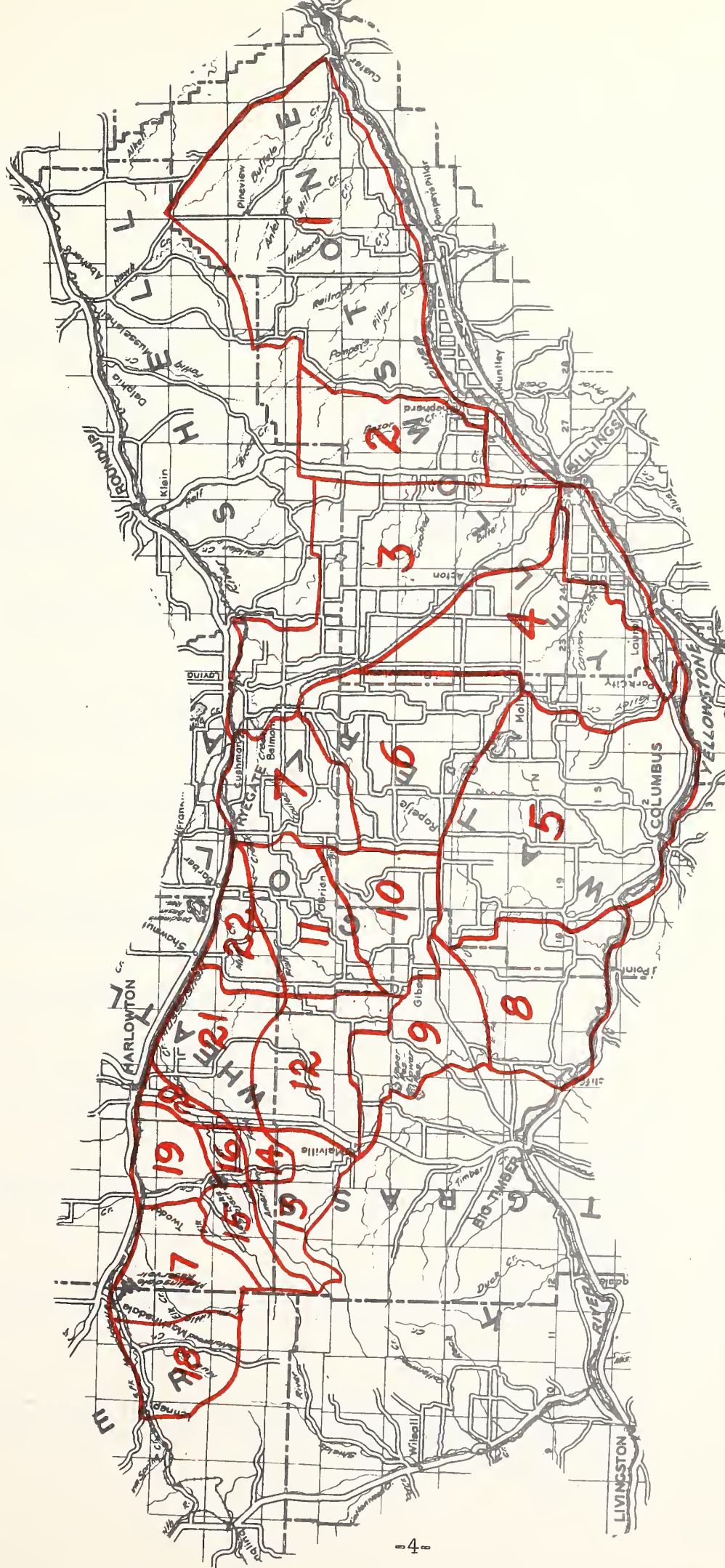


Figure 1. Unit and Subunit boundaries and populations by Subunits.





TABLE I. Antelope Census, 1949 and 1951 (Yellowstone)

| Subunit     | Uncl. |      | Bucks |      | Does |      | Fawns |      | Total |       | Sq. Mi. |
|-------------|-------|------|-------|------|------|------|-------|------|-------|-------|---------|
|             | 1949  | 1951 | 1949  | 1951 | 1949 | 1951 | 1949  | 1951 | 1949  | 1951  |         |
| I           | 4     |      | 5     |      | 21   |      | 8     |      | 38    |       | 562     |
| II          | 5     |      | 6     |      | 43   |      | 19    |      | 73    |       | 154     |
| III         | 34    | 467  | 93    | 50   | 188  | 122  | 84    | 131  | 399   | 770   | 417     |
| IV          | 85    | 269  | 49    | 47   | 123  | 131  | 52    | 118  | 309   | 565   | 284     |
| V           | 477   | 842  | 419   | 120  | 621  | 316  | 511   | 318  | 2028  | 1596  | 455*    |
| VI          | 130   | 184  | 92    | 208  | 290  | 377  | 213   | 323  | 725   | 1092  | 278     |
| VII         | 58    | 241  | 94    | 37   | 194  | 119  | 114   | 96   | 460   | 493   | 159     |
| VIII        | 123   | 123  | 7     | 17   | 55   | 40   | 46    | 38   | 231   | 218   | 208*    |
| IX          | 259   | 65   | 59    | 78   | 89   | 137  | 68    | 164  | 475   | 444   | 143     |
| X           | 162   | 151  | 31    | 99   | 85   | 233  | 84    | 147  | 362   | 630   | 124     |
| XI          | 146   | 522  | 98    | 95   | 217  | 137  | 173   | 139  | 634   | 892   | 141     |
| XII         | 368   | 520  | 10    | 30   | 143  | 42   | 109   | 41   | 630   | 633   | 150     |
| XIII        | 216   | 188  | 59    | 30   | 152  | 94   | 116   | 95   | 543   | 407   | 87      |
| XIV         | 40    | 17   | 70    | 34   | 60   | 64   | 74    | 58   | 244   | 173   | 22      |
| XV          | 83    | 174  | 38    | 24   | 77   | 37   | 79    | 33   | 277   | 268   | 50      |
| XVI         | 113   | 55   | 17    | 34   | 26   | 48   | 22    | 32   | 178   | 169   | 22      |
| XVII        | 203   | 72   | 33    | 98   | 23   | 205  | 29    | 132  | 288   | 507   | 107     |
| XVIII       |       | 4    |       | 6    |      | 8    |       | 10   |       | 28    | 72      |
| XIX         | 134   | 541  | 118   | 56   | 126  | 75   | 145   | 95   | 523   | 767   | 80      |
| XX          | 16    | 128  | 17    | 11   | 4    | 43   | 9     | 45   | 46    | 227   | 22      |
| XXI         | 1248  | 821  | 115   | 398  | 28   | 278  | 36    | 302  | 1427  | 1799  | 127     |
| XXII        | 242   | 110  | 25    | 38   | 15   | 24   | 12    | 10   | 294   | 182   | 66      |
| Grand Total | 4146  | 5494 | 1455  | 1510 | 2580 | 2530 | 2003  | 2326 | 10184 | 11860 | 3730    |

\*Corrected (planimeter error)

Subunits I, II and XVIII were not censused consistantly, i.e., censused in 1949 and not in 1951 or vice versa. These areas have thus been omitted from Tables II and III to allow for consistant comparison of data.

TABLE II. Antelope Census Summary Sheet (Yellowstone)

|                      | <u>1949</u>   |                    | <u>1951</u>   |                    |
|----------------------|---------------|--------------------|---------------|--------------------|
| 1. % herd class.     | 59.1 %        |                    | 53.6 %        |                    |
| 2. % class bucks     | 24.3 %        |                    | 23.7 %        |                    |
| 3. % class does      | 42.4 %        |                    | 39.8 %        |                    |
| 4. % class fawns     | 33.3 %        |                    | 36.5 %        |                    |
|                      | <u>Actual</u> | <u>Computed</u>    | <u>Actual</u> | <u>Computed</u>    |
|                      | <u>Count</u>  | <u>Herd Class.</u> | <u>Count</u>  | <u>Herd Class.</u> |
| 5. Total bucks       | 1444          | 2450               | 1504          | 2805               |
| 6. Total does        | 2516          | 4270               | 2522          | 4707               |
| 7. Total fawns       | 1976          | 3353               | 2316          | 4320               |
| 8. Total Unclass.    | 4137          |                    | 5490          |                    |
| 9. Grand Total       | 10,073        | 10,073             | 11,832        | 11,832             |
| 10. B:D ratio        | 1:1.74        |                    | 1:1.68        |                    |
| 11. D:F ratio        | 1:0.78        |                    | 1:0.92        |                    |
| 12. Adult:Fawn ratio | 1:0.50        |                    | 1:0.58        |                    |
| 13. % ann. inc.      | 49.9 %        |                    | 57.5 %        |                    |
| 14. Sq. Mi. Area     | 2942          |                    | 2942          |                    |
| 15. Ant./ Sq. Mi.    | 3.42          |                    | 4.02          |                    |

TABLE III. Herd Population Determination

|                                | <u>1949</u> | <u>1950</u> | <u>1951</u> |
|--------------------------------|-------------|-------------|-------------|
| Spring Herd                    |             | 7218        | 7308        |
| Actual                         | (6720)      |             | (7512)      |
| Annual Increase                |             |             |             |
| a) 1949 - 49.9 %               | (3353)      |             | 3632        |
| b) 1950 - 53.7 % (2 yr. av.)   |             | 3876        | 3917        |
| c) 1951 - 57.5 %               |             |             | 4192        |
| Actual                         |             |             | (4320)      |
| Summer Herd                    |             |             |             |
| a) 49.9 %                      | (10,073)    |             | 10,940      |
| b) 53.7%                       |             | 11,094      | 11,225      |
| c) 57.5%                       |             |             | 11,500      |
| Actual                         |             |             | (11,832)    |
| Hunting and Trapping<br>Losses | (1776)      | (2687)      | (2949)      |
| Av. Mortality*<br>13%          | 1079        | 1092        | 1155        |
| Surviving Herd                 | 7218        | 7308        | 7728        |

Figures in (Brackets) known from census or records

\* Based on findings in Musselshell Unit

TABLE IV. Southern Wheatland County Summary Sheet

|         | <u>1948</u> |             |             |         | <u>1949</u> |             |         |       |
|---------|-------------|-------------|-------------|---------|-------------|-------------|---------|-------|
| Subunit | Total Ant.  | Area-Sq.Mi. | Ant./Sq.Mi. | Harvest | Total Ant.  | Ant./Sq.Mi. | Harvest |       |
| XIII    | 395         | 87          | 4.55        | {       | 543         | 6.24        | {       |       |
| XIV     | 185         | 22          | 8.41        |         | 244         | 11.09       |         |       |
| XV      | 282         | 50          | 5.64        |         | 277         | 5.54        |         |       |
| XVI     | 138         | 22          | 6.27        |         | 178         | 8.09        |         | 450 M |
| XVII    | 172         | 107         | 1.61        |         | 288         | 2.69        |         | 150 F |
| XIX     | 303         | 80          | 3.78        | 448 T   | 523         | 6.53        |         |       |
| XX      | 77          | 22          | 3.50        |         | 46          | 2.09        |         |       |
| XXI     | 1475        | 127         | 11.57       |         | 1427        | 11.23       |         |       |
| XXII    | 138         | 66          | 2.09        |         | 294         | 4.45        |         |       |
| Total   | 3165        | 583         | 5.45        | 748     | 3820        | 6.57        | 600     |       |
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M - Males  
F - Females  
E - Either  
T - Trapped

1948 - Not classified

1949 - 34.23% herd - fawns; 65.97% herd - adults; 52.07% ann. inc.

1950 - 28.73% herd - fawns; 71.27% herd - adults; 40.33% ann. inc.\*

1951 - 33.51% herd - fawns; 66.49% herd - adults; 50.42% ann. inc.

\*No factual data to justify this radical decline. However, the late spring storm in 1950 was known to have taken a serious toll on Subunits XIII and XIV.

## CONCLUSIONS:

Reference is made to the fluctuations of populations in many sub-units as shown in Table I. It is difficult to attribute these fluctuations to any one cause, as for example in sub-units V and VI. Either poor hunter distribution or migration may have been contributing factors. In the case of sub-unit V, the topography is such that hunters have easy access to the entire area, in contrast to sub-unit VI which is not readily accessible. On the other hand a migration could result in these fluctuations.

The 1949 column in Table II contains discrepancies with respect to the same data presented in the 1950 report. (Summer Aerial Antelope Census, Quarterly Progress Report. Jan-Mar. 1950) These were due to corrections in land area and the exclusion of certain subunits, to make comparison of the two censuses possible.

It is noted in Table II a somewhat radical change in the percent annual increase (49.9 - 57.5%). This change cannot be immediately accounted for and until a more stable annual increase figure presents itself, an average mortality figure cannot be determined for this unit. Thus, in Table III, the mortality figure of 13% (all losses other than hunting and trapping), determined for the Musselshell Unit was used. This figure may or may not apply to the Yellowstone Unit and from the data available it would appear to be slightly high. Variations in adverse conditions, i.e., topography, intensity of storms, poaching, etc. among the different units, would affect the mortality rate. However, by using this 13% mortality figure and an average annual increase figure based on the two census years, the calculated population for 1951 was within 5% of the actual population.

In 1949 the breeding population (6,720 antelope) was thought to be at the desired level with respect to economic conflict. During the past three seasons, 7,412 antelope have been harvested from this unit. In spite of this, the breeding population has increased over one thousand head.

Table IV dealing with southern Wheatland County involves 19.8% of the total area of the unit with 38 per cent of the antelope. This portion of the Yellowstone Unit, because of its high density, is censused annually. Regardless of increased hunting pressure, to a point of saturation with respect to tolerance by landowners, the antelope density has steadily increased (5.45 ant./sq.mi., 1948 to 7.72 ant./sq.mi., 1951).

Since 1948, 3,322 antelope have been harvested from this area, yet the population has increased from 3,165 to 4,499.

Again Table IV reflects that topography (hunter accessibility) is the major factor of fluctuations in populations of sub-units.



Some method of encouraging the landowners in Southern Wheatland County to allow a greater harvest is immediately necessary to bring this ever increasing herd under control.

RECOMMENDATIONS:

1. Better distribution of hunting pressure; this could be accomplished by making separate hunting areas out of some of the more remote sections.
2. Heavier harvest over the entire area.
  - A. Seventeen per cent increase occurred during the two year period 1949 to 1951.
  - B. In addition, approximately 40 per cent of this increase is restricted to 20 per cent of the land area, southern Wheatland County. Because of the small area and high density of antelope, considerable rancher opposition (too many hunters) has been encountered in attempting to properly harvest antelope from this area. Therefore, it is recommended that the necessary groundwork be accomplished, i.e., this information be presented to the landowners, as to the need for a greater harvest.
3. Surveys should be continued until a usable annual increase and mortality figures are obtained for management purposes. Perhaps a static figure will never present itself in which case biennial counts would have to be continued.

An additional number of permits should be issued on bucks only. By reducing the number of bucks, not only is the range pressure reduced but also the productivity maintained.

Prepared by Donald E. Johnson

Approved by Robert F. Cooney

Don L. Brown

Date March 15, 1952



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 1-R (Eastern) Work Plan No. I Job No. I-A and E

Title of Job: Eastern Montana Antelope Census

DATE:

June, July, August, 1951

PERSONNEL:

Raleigh Shields, Waldo Vangsness,  
John Nicolay, William Maloit,  
Deputy Game Wardens

Jack Mahood, Sportsman

Donald E. Johnson, Jr. Biologist

Don L. Brown, Biologist

OBJECTIVES:

1. To develop a census technique less time consuming than total coverage surveys, i.e., strip method.
2. To gather population density data for better management.

TECHNIQUES USED:

Surveys of 1943 and 1944 marked the beginning of aerial census in Montana. During that period a strip method was used without predetermined flight lines. That survey was chiefly one to locate antelope herds and flight lines more or less followed likely looking antelope range.

It was the intent of the present survey to use a grid technique with flight lines at twelve mile intervals and record only antelope observed one-half mile on each side of the plane.

Hunting area boundaries were used as grid pattern boundaries.\* Upon completion of an area the total number of antelope (on strip) were divided by the miles flown (on strip). This supplied a figure that could be applied to the entire area for determining the antelope density.

To have a check on this method several areas were also censused by the complete-coverage technique. In both cases antelope per square mile was the base figure.

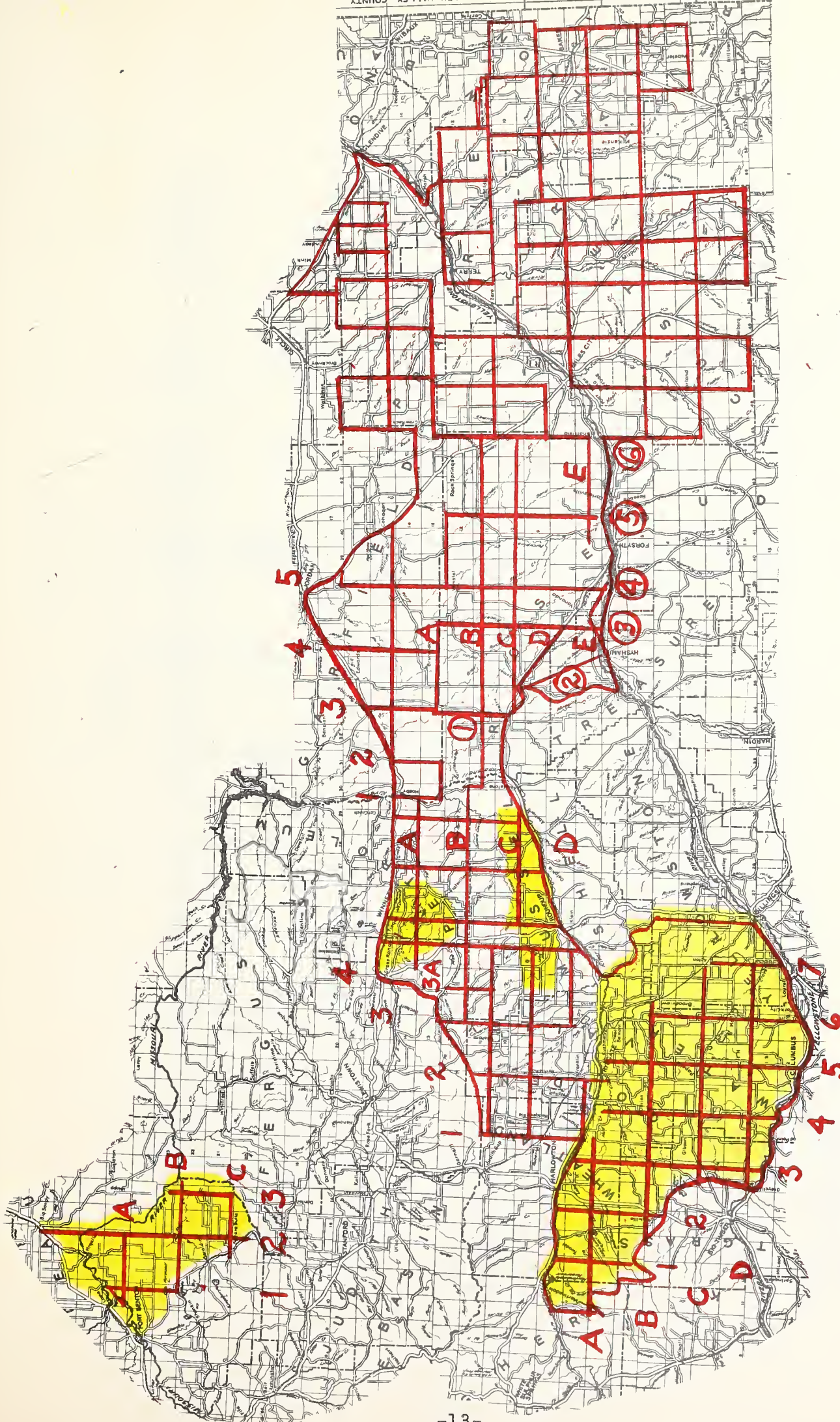
The survey was conducted during the spring season to take advantage of antelope being more evenly distributed over their ranges.

#### FINDINGS:

See Figure I on following page.

\*Exception - Boundaries of hunting area #1 were changed subsequent to the survey.





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Area of strip coverage (12 miles)  
Area of complete coverage

Figure 1. Flight strips, boundaries and shaded areas of complete coverage--eastern Montana.

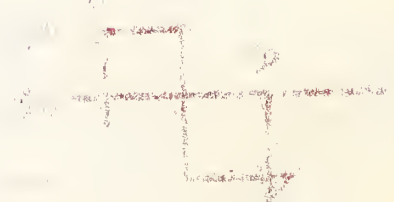
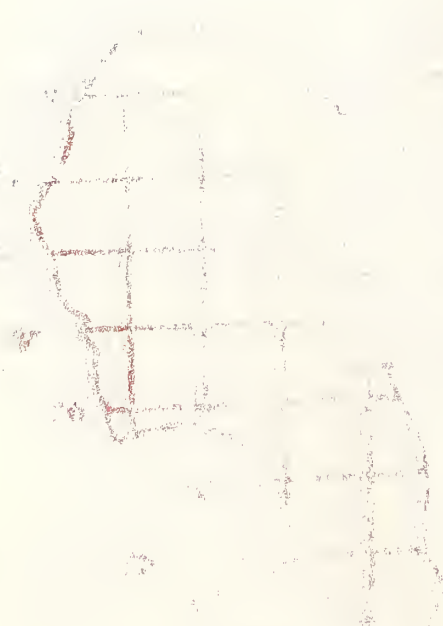




TABLE I

| Hunting Area     | Census Technique     | Strips | Direction | Antelope                       | Strip Miles | Ant./Sq.Mi. | Total Area | Total Antelope | Error Ant./Sq.Mi. |
|------------------|----------------------|--------|-----------|--------------------------------|-------------|-------------|------------|----------------|-------------------|
| 1                | Strip                | I-III  | N-S       | 62                             | 66          | .94         |            |                |                   |
| Chouteau Unit    |                      | A-C    | E-W       | 43                             | 63          | .68         |            |                |                   |
|                  | Complete             |        |           | <u>105*</u>                    | <u>129</u>  | <u>.81</u>  | 760        | 616            |                   |
|                  |                      |        |           | 851*                           |             | 1.12        |            | 851            | 0.31              |
| 3,4,5,7          | Strip                | I-VII  | N-S       | 748                            | 221         | 3.38        |            |                |                   |
| Yellowstone Unit |                      | A-D    | E-W       | 1,005                          | 215         | 4.67        |            |                |                   |
|                  | Complete             |        |           | <u>1,753**</u>                 | <u>436</u>  | <u>4.02</u> | 2,525      | 10,150         |                   |
|                  |                      |        |           | 11,062**                       |             | 4.38        |            | 11,062         | 0.36              |
| 9                | Strip                | I-IV   | N-S       | 264                            | 114         | 2.32        |            |                |                   |
| Musselshell Unit |                      | A-D    | E-W       | 320                            | 132         | 2.42        |            |                |                   |
|                  | Complete (sample)    |        |           | <u>584*</u>                    | <u>246</u>  | <u>2.37</u> | 1,238      | 2,934          |                   |
|                  | (Lake Mason Subunit) |        |           | Plus Estimated Annual Increase |             | @ 61%,      | 1810....   | 4,744          |                   |
|                  |                      |        |           | 484**                          | 120         | 4.03        | 1,238      | 4,988          | 0.12              |
| 10               | Strip                | I-III  | N-S       | 177                            | 104         | 1.70        |            |                |                   |
| Musselshell Unit |                      | A-C    | E-W       | 206                            | 108         | 1.91        |            |                |                   |
|                  | Complete (Sample I)  |        |           | <u>383*</u>                    | <u>212</u>  | <u>1.81</u> | 1,327      | 2,402          |                   |
|                  | (Willow Creek)       |        |           | Plus Estimated Annual Increase |             | @ 61%,      | 1465....   | 3,866          |                   |
|                  | (Sample II)          |        |           | 815**                          | 258         | 3.16        |            |                |                   |
|                  | (Yellowwater)        |        |           | 814**                          | 273         | 2.98        |            |                |                   |
|                  |                      |        |           | <u>1,629**</u>                 | <u>531</u>  | <u>3.07</u> | 1,327      | 4,074          | 0.16              |

\*Excluding Fawns

\*\*Including Fawns

TABLE II

| Hunting Area                               | Census Technique   | Strips     | Direction                  | Antelope Miles           | Strip Ant./ Sq.Mi.          | Total Area | Total Antelope |
|--|--------------------|------------|----------------------------|--------------------------|-----------------------------|------------|----------------|
| 12,13 No. Half Missouri Breaks Unit        | Strip I-V<br>A-D   | N-S<br>E-W | 150<br>197<br><u>347*</u>  | 85<br>143<br><u>228</u>  | 1.76<br>1.38<br><u>1.52</u> | 1,252      | 1,903          |
| 12,13 So. Half Custer Unit                 | Strip I-VI<br>A-E  | N-S<br>E-W | 250<br>259<br><u>509 *</u> | 183<br>251<br><u>434</u> | 1.37<br>1.03<br><u>1.17</u> | 2,818      | 3,297          |
| 15A Glendive Unit                          | Strip I-IV<br>A-B  | N-S<br>E-W | 27<br>23<br><u>50*</u>     | 58<br>42<br><u>100</u>   | 0.47<br>0.55<br><u>0.50</u> | 466        | 233            |
| 17 Custer and Glendive Units               | Strip I-IV<br>A-C  | N-S<br>E-W | 50<br>77<br><u>127*</u>    | 103<br>98<br><u>201</u>  | 0.49<br>0.79<br><u>0.63</u> | 998        | 629            |
| 18 Glendive Unit                           | Strip I-IV<br>A-B  | N-S<br>E-W | 59<br>69<br><u>128*</u>    | 47<br>71<br><u>118</u>   | 1.26<br>.97<br><u>1.08</u>  | 690        | 745            |
| 19 Glendive and Carter Units               | Strip I-IV<br>A-E  | N-S<br>E-W | 115<br>100<br><u>215*</u>  | 164<br>157<br><u>321</u> | 0.70<br>0.64<br><u>0.67</u> | 1,630      | 1,092          |
| 20 Custer Unit<br>No. of Yellowstone River | Strip I-III<br>A-C | N-S<br>E-W | 40<br>61<br><u>101*</u>    | 82<br>70<br><u>152</u>   | 0.49<br>0.87<br><u>0.66</u> | 730        | 482            |
| So. of Yellowstone River                   | Strip I-VI<br>A-E  | N-S<br>E-W | 197<br>174<br><u>371*</u>  | 279<br>230<br><u>509</u> | 0.71<br>0.76<br><u>0.73</u> | 2,940      | 2,146          |
| Hunting Area 20 Combined                   | Strip I-VI<br>A-E  | N-S<br>E-W | 237<br>235<br><u>472*</u>  | 361<br>300<br><u>661</u> | 0.66<br>0.78<br><u>0.71</u> | 3,670      | 2,606          |

\*Excluding Fawns



## CONCLUSIONS:

From the data available strip-method counts provide population figures lower than complete-coverage counts. On areas where both methods were used the error ranged from .12 ant./sq.mi. to .36 ant./sq.mi.

Strip counts included all types of habitat and antelope densities. For example in hunting area #1, over 50% of the antelope occupied 10% of the area as found in the complete coverage. Whereas in the Yellowstone Unit (areas 3, 4, 5 and 7) a relatively more uniform distribution was encountered. This may introduce an error which would be greatly magnified in the case of area #1 in that the area and the total number of antelope are both relatively small.

An interesting observation is the number of antelope per square mile that different percentages of error represent. In area #1 a difference of 235 antelope (.31 ant./sq.mi.) between the strip count and complete count represents 27.6% error, as compared to the Yellowstone Unit where a difference of 812 antelope (.36 ant./sq.mi.) represent an error of only 7.3%. Thus it is concluded that when computing this error, antelope per square mile rather than percent of error be used.

It is concluded that no attempt to strip count antelope be made during the fawning period. Either the count should precede the fawning period and a predetermined increase be added, or the survey should be held off until all the fawns are big enough to move about and thus be tabulated. Usually this would mean a cessation of activities between the last week in May and the last week in June.

It is doubtful if increase and natural loss data gathered for any one major antelope range is applicable to another. Therefore, these data must be established before hunting populations could be computed from spring or winter strip counts.

In areas 9 and 10, small areas within each hunting area were given complete coverage and the ant./sq.mi. figure was used to compute the population of the entire area. Thus this may be introducing another error and therefore those figures should be used with reservations.

In using the grid method of strip-counting considerable time and miles are wasted flying cross-country to complete this pattern. It is suggested a new pattern be established that would eliminate the "dead-head" miles without reducing the adequacy of the sample. In establishing a new pattern, consideration should be given the major direction of strips. North-south strips are most desirable from the standpoint of eliminating an error through antelope missed. Traveling into the sun in late evening or early morning presents a flying hazard plus a dilemma to the observer in trying to look backwards and cover both sides of the plane.

RECOMMENDATIONS:

This experiment in strip-counting should be continued until proven, using an improved technique developed from the experience of previous years error and findings.

Submitted by Donald E. Johnson

Approved by Robert F. Cooney

Don L. Brown

Date March 13, 1952

JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 1-R (Eastern) Work Plan No. III Job No. III-C

Title of Job: Population Studies of Deer (Fort Peck Game Range and Vicinity)

INTRODUCTION:

This deer herd has just recently been added to the growing list of important herds in Montana. It is referred to as the herd occupying southern Phillips and northern Fergus and Petroleum counties and is separated by the Missouri River. Most of this report includes the herd in habitat within the influence of the western Fort Peck Game Range. However, portions deal entirely with the results of a special either sex deer season, Nov. 17-25, 1951, on those portions of the Game Range lying in Phillips, Fergus and Petroleum counties. One hundred and fifty permits each were issued for each side of the river during this special season.

OBJECTIVES:

The prime objective of all the various portions of this study is to supply quantitative information for sound management recommendations for this growing herd.

TECHNIQUES USED:

Numbers and sex of harvested animals and sex ratio counts, pre- and post-hunting season must be known to determine the population using formulas developed by George H. Kelker(1).

The ovarian analysis was developed by E. L. Cheatum (2) who was also kind enough to analyze the sample brought in by cooperative hunters during the special season. Our sincerest thanks are extended to Dr. Cheatum for his cooperation.

Checking stations and postal card returns furnished the species, sex and age information of the harvest.

FINDINGS:

Population Determination

Tables I deal with the special season within the western

boundaries of the Game Range.

TABLE I-A Breakdown of Special Deer Kill

| <u>Areas</u> | <u>Fawns</u> | <u>Adults</u> | <u>Not Aged</u> | <u>Unsucc.</u> | <u>Returns</u> | <u>Permits</u> |
|--------------|--------------|---------------|-----------------|----------------|----------------|----------------|
| Fergus       |              |               |                 |                |                |                |
| Number       | 25           | 79            | 5               | 11             | 120            | 150            |
| % return     | 21%          | 66%           | 4%              | 9%             | 100%           |                |
| Phillips     |              |               |                 |                |                |                |
| Number       | 4            | 27            | 59              | 9              | 99             | 150            |
| % return     | 4%           | 27%           | 60%             | 9%             | 100%           |                |

TABLE I-B Species Composition and Sex of Known Kill

| <u>County</u> | <u>Spp.</u> | <u>%</u> | <u>Sex</u> | <u>%</u> |
|---------------|-------------|----------|------------|----------|
| Fergus        | MD          | 87       | Males      | 45       |
|               | WT          | 13       | Females    | 55       |
| Phillips      | MD          | 89       | Males      | 43       |
|               | WT          | 11       | Females    | 57       |

If we may apply the percentages from card returns and hunters checked to the total number of permits issued, weighing the sample of "not aged" animals, our kill breakdown would appear as in Table I-C.

TABLE I-C Computed Total Kill and Success

|         | <u>Fergus</u> | <u>Phillips</u> | <u>Both</u> |
|---------|---------------|-----------------|-------------|
| Fawns   | 33            | 18              | 51          |
| Adults  | 103           | 119             | 222         |
| Unsucc. | <u>14</u>     | <u>13</u>       | <u>27</u>   |
| Total   | 150           | 150             | 300         |

Harvest data from the regular buck season (Oct. 15-21, 1951) are found in Montana Quarterly Report 11(4):11, 1951. These data include the Game Range Area. Table II shows the total kill by sex for the two seasons as well as the adjusted figures to compensate for local unchecked hunting.



TABLE II. 1951 Deer Harvest - Fort Peck Game Range and Vicinity

|         | <u>Regular</u> | <u>Special</u> | <u>Combined</u> | <u>Adjusted</u> |
|---------|----------------|----------------|-----------------|-----------------|
| Males   | 797            | 98*            | 895             | 1,000           |
| Females | -              | 124*           | 124             | 140             |
| Fawns   | -              | 51             | 51              | 60              |

\*from %'s in Table I-B

By substituting kill figures and sex ratios (reported in Quarterly Report 11(4), 1951) into the Kelker formula (1) using the symbols and equations found below, we arrive at estimated wintering populations of does, bucks, fawns and deer in Table III.

- D -- total doe population  
 $K_B, K_D$  -- kill of bucks and does, respectively  
 $b_b$  -- ratio B:D before hunting season  
 $b_a$  -- ratio B:D after hunting season  
 $d_d$  -- ratio D:B before hunting season  
 $d_a$  -- ratio D:B after hunting season

$$D = \frac{d_b \quad d_a \quad K_B}{d_a - d_b} \quad (\text{buck harvest only})$$

$$D = \frac{b_b \quad K_D - K_B}{b_a - b_b} \quad (\text{either sex harvest})$$

By multiplying the estimated doe population by post-season D:F and B:D ratios, the populations of fawns and bucks, respectively, are determined.

TABLE III. Population Determinations - Game Range and Vicinity

|           | <u>1949*</u> | <u>1950</u> | <u>1951</u> |
|-----------|--------------|-------------|-------------|
| Does      | 1,535        | 1,850       | 2,000       |
| Bucks     | 580          | 700         | 760         |
| Fawns     | 1,215        | 2,300       | 2,470       |
| Total     | 3,330        | 4,850       | 5,230       |
| Buck Kill | 400          | 800 (est.)  | 1,000       |
| Doe Kill  | 0            | 0           | 140         |
| Fawn Kill | 0            | 0           | 60          |

\*from Quarterly Report 10(1), 1950

### Age Composition

Ageing the kill was not attempted at the checking stations. However, a sample collection of jaws was taken during the special season and are recorded in Table IV.

TABLE IV. Age Composition of Sample of Special Kill

| <u>Age Class</u> | <u>% of Sample</u> | <u>Age Class</u> | <u>% of Sample</u> |
|------------------|--------------------|------------------|--------------------|
| Fawn             | 16%                | 3½               | 10%                |
| 1½               | 29%                | 4½               | 13%                |
| 2½               | 16%                | 8½ - 9½          | 3%                 |
| 2½ - 3½          | 6%                 | 10 /             | 6%                 |

### Productivity

From a sample collection of 17 reproductive tracts eight were animals with virginal uteri and showing no old corpora lutea scars. One specimen was atypical (possibly due to a pathological condition) while another was incomplete (only one ovary). Seven specimens were complete and exhibited mature uteri. Recorded below in Table V are these specimens with productivity calculations.

TABLE V. Ovarian Analysis of Seven Mature Reproductive Tracts

| <u>Field No.</u> | <u>Age</u> | <u>Spp.</u> | <u>No. New<br/>Corpora Lutea</u> | <u>Corpora Lutea Scars</u> |
|------------------|------------|-------------|----------------------------------|----------------------------|
| 4                | 2½         | MD          | 0                                | 1                          |
| 8                | 4½         | MD          | 0                                | 2                          |
| 25               | 3½         | MD          | 1                                | 1                          |
| 26               | 3½         | WT          | 0                                | 2                          |
| 29a              | 4½         | MD          | 2                                | 1                          |
| 50               | 8½ - 9½    | MD          | 0                                | 2                          |
| 54               | 2½         | MD          | 0                                | 1                          |
|                  |            |             |                                  | 10                         |

2 animals pregnant from last breeding season, 1951 (#25 & 29a)  
 7 animals pregnant from breeding season, 1950  
 10 ova produced in 7 estrus cycles.

A frequency of fertilization figure of .85 was found by Dr. Cheatum for some New York deer herds. This figure is used to convert corpora lutea scar counts to embryos or may arbitrarily be used to convert scars to fawns at birth. For lack of a known figure for this herd we shall use .85.

10 ova x .85 = 8.50 est. fawn production

8.50 ÷ 7 deer = average 1.21 fawns / doe.



## ANALYSIS AND RECOMMENDATIONS:

White-tailed deer comprised 12% of the special and approximately 10% of the regular kill (Quarterly Report 11(4):11, 1951). This substantiates field observations, i.e., mule deer outnumbering white-tails 10 to 1.

The calculated deer population is not remaining very static when hunter harvest can increase 200% and the herd increases 58% over 1949. Certain portions of this range are showing some signs of heavy use as previously reported. However, those areas may be isolated if some pressure is taken off the forage resource. As shown in Table III, the antlerless classes are increasing rapidly compared with the antlered class. Therefore, it is recommended that the herd not be allowed to increase further through increased hunter harvest of the antlerless classes.

From the sample of jaws and reproductive tracts collected it would seem that this herd is in good condition. The first three age classes comprised over 60% of the kill and estimated fawn production was 1.21 fawns/does from ovarian analysis. It is interesting to note that the results of ovarian analysis and doe:fawn ratios, as found in the aerial sex ratio counts, came within .04 of each other. It is recommended the same practices be continued, with respect to sex ratio counts and ovarian analysis, to determine if a correlation exists between the two methods. In addition ground sex ratio counts could be added to further be compared.

## SUMMARY:

Numbers, age, sex and species composition and ovarian analysis of the 1951 harvest on the Fort Peck Game Range and vicinity were analyzed. Using the kill figures and Kelker's formula populations were determined.

1. Mule deer made up 88% of the special either sex kill and white-tails 12%. Bucks made up 44%, while females comprised 56%.
2. The total known kill, for both regular and special seasons, was 1,070 deer.
3. Population determination, by Kelker's formula, for 1949 was 3,330 deer and for 1951 was 5,230. Between '49 and '51 the increase in hunter take was approximately 200%.
4. The first three age classes made up over 60% of a sample of the special kill.
5. Ovarian analysis showed an estimated average fawn production of 1.21 fawns/doe.

DATA AND REPORTS:

Original reports and data may be found in the files of the office of the eastern division, Montana Fish and Game Department, 201 Bank-Electric Building, Lewistown, Montana.

Special thanks are extended to all hunters who cooperated in securing specimens and information used in this report.

Bibliographies not listed in the text are listed below.

- (1) Kelker, George H. Sex-ratio equations and formulas for determining wildlife populations. Proceedings of the Utah Academy of Sciences, Arts & Letters. Vols. 19 and 20.
- (2) Cheatum, E. L. 1949. The use of corpora lutea for determining ovulation incidence and variations in the fertility of white-tailed deer. The Cornell Veterinarian, XXXIX (3):282-291.

Prepared by Donald E. Johnson

Approved by Don Brown

Date \* March 12, 1952

JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 1-R (Eastern)      Work Plan No. IV      Job. No. IV-B

Title of Job: Population Studies of Deer (Little Belt Mountains)

OBJECTIVES:

To analyze the checking station and post card results of the special either sex mule deer season (Dec. 21, 1951 - Jan. 1, 1952) held on two ranches along the Judith River in the Little Belts.

TECHNIQUES USED:

Postal cards were sent to all hunters who were not checked at the Utica Station. At the checking station, reproductive tracts and jaws brought in by cooperative hunters were collected. Weights were obtained from all deer which were only hog-dressed (entrails only removed). Hind foot measurements were taken.

FINDINGS:

Ten hunters did not report, while 83 were successful and 7 unsuccessful. Sixty-six of the 83 successful checked through the station. The age class breakdown of 57 of these 66 deer is as follows:

|       |   |     |        |   |             |
|-------|---|-----|--------|---|-------------|
| Fawns | - | 40% | 5½     | - | 4%          |
| 1½    | - | 9%  | 6½     | - | 4%          |
| 2½    | - | 12% | 7½-8½  | - | 5%          |
| 3½    | - | 16% | 9½-10+ | - | 3%          |
| 4½    | - | 7%  |        |   | <u>100%</u> |

Table I shows the age, weight and hind foot relationship of 44 of the 66 checked mule deer.

TABLE I. Age - Weight - Hind Foot Relationship

| Age      | No. in Sample | Mean Wt.(lbs.) | Wt. Range | Mean H.F. (in.) | H.F.Range     |
|----------|---------------|----------------|-----------|-----------------|---------------|
| Fawn     | 16            | 46.6           | 36 - 56   | 15.8            | 14.50 - 16.75 |
| 1½       | 4             | 78.3           | 70 - 85   | 18.2            | 17.50 - 19.50 |
| 2½       | 7             | 101.9          | 88 -112   | 18.1            | 17.25 - 19.00 |
| 3½       | 7             | 109.7          | 95 -125   | 18.4            | 18.00 - 18.75 |
| 4½       | 3             | 112.3          | 105 -125  | 18.3            | 17.50 - 19.00 |
| 5½       | 1             | 100.0          |           | 18.5            |               |
| 6½       | 2             | 90.5           | 90 - 91   | 18.1            | 17.75 - 18.50 |
| 7½ - 8½  | 3             | 89.3           | 87 - 92   | 18.0            | 17.75 - 18.50 |
| 9½ - 10+ | 1             | 92.0           |           | 18.3            |               |

The ovarian analysis of the 16 reproductive tracts brought in was conducted by Dr. E. L. Cheatum. Table II contains the results of the analysis of the reproductive tracts which indicated estrus cycles occurring during the fall of 1950.

TABLE II. Ovarian Analysis of Deer Reproductive Tracts

| Field No. | Age      | No. New Corp. Lut. | No. Old Corp. Lut. Scars | Pregnancy Status |
|-----------|----------|--------------------|--------------------------|------------------|
| 27        | 3½       | 2                  | 1                        | /                |
| 31        | 4½       | 2                  | 1                        | /                |
| 58        | 4½       | 2                  | 2                        | /                |
| 11        | 5½       | 2                  | 2                        | ? no embryo vis. |
| 43        | 7½ - 8½  | 2                  | 2                        | ? no embryo vis. |
| 23        | not aged | 2                  | 2                        | /                |
| --        | not aged | 2                  | 1                        | /                |
|           |          |                    | <u>11</u>                |                  |

7 estrus cycles (Fall, 1950) produced 11 ova.

11 x .85 (arbitrary frequency of fertilization rate used for lack of known figure for this herd)

= 9.35 est. fawn production

9.35 x 7 = est. 1.34 fawns/doe (Spring, 1951)

#### ANALYSIS AND RECOMMENDATIONS:

Only the deer killed during this special season could be analyzed. A 30-day buck season also takes place in this area earlier in the fall (Oct. 15 - Nov. 15) but limited effort has ever been made to get sound quantitative data on these deer. It is very strongly recommended that this station (Utica) be manned by trained personnel with an appreciation for good hunter harvest data and collections.

It is interesting to compare the weights of these mule deer with those collected in 1949 in the Ashland Division (Mont. Quarterly Report 10(1):53, 1950). The Ashland bucks were reported to have been light but this was attributed to the sample. Below are the weights in 4 age-classes. It can readily be seen from Table I that the Judith River deer were considerably lighter in all classes.

- - - - -

|               |              |
|---------------|--------------|
| 1½ years      | 96 pounds    |
| 2½ years      | 126.6 pounds |
| 3½ - 4½ years | 152.7 pounds |
| 5½ years      | 192.3 pounds |

- - - - -



In addition, the maximum Judith River weight taken was only 125 pounds. The larger portion of the Judith deer were females while all the Ashland's were bucks which possibly accounts for some of the difference in weights as well as the time of year these weights were obtained (Ashland in October - Judith in December).

The foothills of the Little Belt Mountains (Judith River area) have long been considered a severely overused range. Cattle, horses, sheep, deer and elk all use or have used portions of this range. Although factual data are lacking concerning the range condition and numbers of animals, it is quite obvious that the stocking rate should be reduced. With the relatively high estimated productivity of the female deer (1.34 fawns/doe) in the area and the seemingly light weight of the individual animals it would appear that there should be a reduction in population. It is recommended, on the basis of this amount of data and from field observations, that this area be opened to either sex deer hunting to reduce the number of deer. Possibly a 10-day either sex season should be the maximum.

#### SUMMARY:

An analysis of the 100 head either sex deer season on the Judith River was conducted. Jaws, reproductive tracts, weights and hind-foot measurements were obtained at the Utica checking station.

- (1) The first four age classes made up 77% of the sample checked.
- (2) Hog dress weights ranged from 36 (fawn) to 125 pounds ( $3\frac{1}{2}$  and  $4\frac{1}{2}$  years). These were compared with weights taken in the Ashland Division in October 1949 on bucks. Hind foot measurements ranged from 14.50 to 19.50 inches.
- (3) Analysis of ovaries showed an estimated 1.34 fawns produced per doe (Spring, 1951).
- (4) An attempt was made to compare field observations with these data.

#### DATA AND REPORTS:

Original reports and data may be found in the files of the office of the eastern division, Montana Fish and Game Department, 201 Bank-Electric Building, Lewistown, Montana.

Thanks are extended to Dr. E. L. Cheatum for his fine cooperation with this Department in conducting the ovarian analysis. Further thanks are extended to Joe Townsend for his assistance on the checking station.

Prepared by Donald E. Johnson                      Approved by Don Brown

Date March 13, 1952





STATE Montana  
PROJECT NO. 1-R-11 (Western)  
DATE March 30, 1952  
VOL. III NO. I

QUARTERLY PROGRESS REPORT FOR  
INVESTIGATIONS PROJECTS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Wildlife Survey and Management (Western)
2. Leader: Lloyd E. McDowell, Biologist
3. Report of Progress:

Work Plan I: Big Game Population Studies

- Job I-A: Big Game Survey in South Fork of Flathead  
Aerial census was finished during the past quarter. A total of 1041 elk were counted in the Big Prairie District, 1018 in the Spotted Bear District, and 392 in the Schafer District. A spring check will be made to find the winter kill and inspect the condition of the range. A final report will be given at the end of June.
- Job I-B: Big Game Survey in Blackfoot-Clearwater  
Work in the area will be finished in the near future and reported in the June final.
- Job I-C: Big Game Survey in Swan  
Spring check of winter losses are now being conducted. Final report will be submitted in June.
- Job I-D: Big Game Survey in Thompson Falls - Cherry Creek  
Very little work was done in this area due to problems in other parts of the unit.
- Job I-E: Big Game Survey in Fish Creek  
A spring field trip was made to this area. The winter was very mild in the area and all game came through in fine shape. Logging operations provided a lot of browse at the lower elevations on the white-tailed deer range.
- Job I-F: Big Game Survey in Petty Mountain  
One aerial flight was made to this area in March. It was too late to get a complete census, but 47 elk were seen. The area had an open winter and logging

operations seemed to be providing much browse for both deer and elk.

Job I-G: Big Game Survey in Garnet Range

This area was covered in March by plane and one field trip. Many less elk were found than believed to be in the area. A total estimate of 150 was agreed upon.

Job I-H: Big Game Survey in Bitterroot

A total of 242 elk were counted on the East Side during an aerial census. It is planned to set up a special study in this area for the next year as there is need for more detailed work.

Work Plan II: Big Game Reproduction, Age Classification and Hunter Utilization

Job II-A: Age Classification and Herd Rate of Increase

This work was reported in the January Quarterly.

Job II-B: Hunter Utilization

This work was completed in December and reported in the January Quarterly.

Work Plan III: Study of the Migratory Habits of Big Game in Key Areas

Job III-A: Tagging and Release of Mature Elk on the Blackfoot-Clearwater Game Range

Annual job completion report attached.

Job III-B: Tagging and Release of Mature Elk in the Bitterroot  
Job completed. A total of 4 elk were trapped in the Bitterroot at the Holms McClay ranch and transported to the Blackfoot Game Range.

Work Plan IV: Range Inspection and Browse Measurements

Job IV-A: Forage Utilization on Key Areas

Work is being continued on the job and will be reported on at a later date.

Job IV-B: Range Condition Survey

Work is being continued on this project.

Work Plan V: Rocky Mountain Sheep Investigation

Job V-A: Mountain Sheep Census and Distribution

A total of 38 mountain sheep were counted on Wild-horse Island. A total of 24 were counted on Rock Creek. More work will be done at a later date.

Job V-B: Mountain Sheep Herd Classification and Sex Ratio Determination

Work being continued.

Job V-C: Value of Salt in Mountain Sheep Management

Work being continued.

Job V-C: Value of Salt in Mountain Sheep Management  
Work being continued.

Work Plan VI: Rocky Mountain Goat Investigation

Job VI-A: Study of Movements and Migration of Mountain Goats  
Work on this project will start in May this year.

Job VI-B: Age Determination by Tooth Wear and Replacement  
Work being continued.

Job VI-C: Sex Ratio and Herd Reproductive Studies  
Work being continued.

Job VI-D: Study of Mountain Goat Winter Range Distribution  
Some additional information was gained on this part of the work during the winter census by air. Data will be added to mountain goat report.

Work Plan VII: Aerial Salt Distribution

Job VII-A: Aerial Salt Distribution  
This work will be done in May and June and reported at a later date.

Submitted by:

Approved by:

Name Lloyd E. McDowell

Montana State Department of Fish & Game

Title Biologist

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952





PROJECT I-R-11 (Western)    WORK PLAN NO. III    JOB NO. III-A

TITLE:    TAGGING AND RELEASE OF MATURE ELK ON THE BLACKFOOT-CLEARWATER  
          GAME RANGE

PERSONNEL:    Stan Mongrain, Unit Manager  
                                Blackfoot-Clearwater Game Range  
                  Jack Ray, Junior Fieldman  
                  Al Mullenax, Laborer  
                  Frank Gummer, Fieldman

Trapping and tagging mature elk at the Blackfoot-Clearwater Unit was strictly in the experimental stage this winter. One trap was built and set up in a location where about two hundred elk were being fed hay.

A trap site was selected and hay fed each day at this site in order to draw the elk to this same spot each day. After the trap was set up, hay and molasses cake was fed inside the trap for two days with the feeding on the outside discontinued. The third night an automatic trip was set on the gate leading into the trap. Fifty-eight head of elk were trapped that night. These elk were very wild and abused the trap in every way they could but could not damage it.

From the large corral section of the trap, a few elk at a time were herded into a smaller pen and on into a chute to be tagged. A metal stock tag was clipped into each ear with a plastic disc about two inches in diameter under each tag. It was hoped this plastic disc would be a means of identification from the ground and air. These discs were not satisfactory due possibly to the cold weather. The temperature during the tagging ranged from zero to thirty below. The plastic became very brittle and where the tag punctured the ear, it became sore. The animal would reach up with a hind foot and scratch at his ear and consequently break the plastic disc out of the tag. Only two or three elk caught at later dates were found to have torn out the metal tags but all of them had broken out the plastic.

A total of seventy-one elk was tagged at the first trapping site.

This trap was built in cooperation with the Western Montana Fish and Game Association. The trap is to be used in western Montana.

Realizing the need for more traps, the Department decided to build two more traps. As we were already set up and the material available close to headquarters, plans were made to build the traps at Blackfoot-Clearwater headquarters. One trap went to the Run River and one was kept in the Blackfoot-Clearwater area.

After the traps were finished, the road conditions would not allow moving the trap to the Sun River. Both traps were set up in the Blackfoot at ranches that were being bothered by small bunches of elk.

One trap set up at the Baurbor Ranch caught thirty-one head. These elk were tagged with a metal tag in each ear with a nylon ribbon seven inches

long hanging from each tag. This bunch of elk were hauled onto Department owned range. To date these elk are in the same vicinity in which they were released and the nylon ribbons are visible for one-half mile with field glasses.

The Sun River trap was set up on the Dave James property. Apparently, the elk at the James Ranch have bothered him for years. They stayed on his ranch the year around. This trap worked very well. A total of forty-one head of elk were moved from the James property after being tagged with the ribbon markers. These elk were turned onto Department owned range on the Clearwater side.

A total of 157 elk was trapped this winter. Twelve escaped without tags by jumping out over the top after sixteen inches of packed snow had built up inside the trap. Two were hurt in transporting. One hundred and forty-three were tagged and released.

Submitted by Stan Mongrain Approved by Lloyd E. McDowell

Date April 15, 1952

|             |                |     |   |
|-------------|----------------|-----|---|
| STATE       | Montana        |     |   |
| PROJECT NO. | 35-R-3         |     |   |
| DATE        | April 15, 1952 |     |   |
| VOL.        | III            | NO. | I |

QUARTERLY PROGRESS REPORT FOR  
INVESTIGATIONS PROJECTS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Gallatin Management Unit
2. Leader: J. E. Gaab, Unit Biologist

Norman Wortman, Fieldman  
Arnold Meister, Part-time Laborer  
Austin McDonald, Part-time Laborer

3. Report of Progress:

Work Plan I: Big Game Population Studies

Job I-A: Progressing.

1. General inspection of deer range East and West Rosebud River.
  - a. Heavier deer concentration on West Rosebud than usual. The closed area is recommended abandoned.
2. General inspection of deer range main Stillwater River
  - a. Deer in poor condition and competing with mountain sheep on an over-used range in the present closed area. The closed area recommended open to deer hunting during 1952 season providing the Mouat mine and mill are not in operation.
3. General inspection of deer range in West Boulder River
  - a. Deer population and forage availability appear to be in balance.

Job I-B: Inactive during report period.

Job I-C: Progressing.

Job I-D: Progressing.

1. Emergency winter elk feeding experiment completed. Detailed report pending.
2. Winter loss estimated from 250 to 300 elk.
  - a. Winter ticks had a definite influence on this heavy loss.
3. Forty mountain sheep counted in Deer Creek-Asbestos Creek area.

Job I-E: Work finished; job completion report attached.

Job I-F: Progressing.

Aerial elk census - 42 Upper Ruby. Range condition inspection reveals that present management is not reducing the deer population adequately.

Job I-G: Work finished; job completion report attached.

Job I-H: Progressing.

1. Aerial elk census in Lima Hills - 321 elk.
2. Two inspections of Scudder Creek deer
  - a. Maximum utilization of Mountain mahogany and juniper. Deer are forced into tall sagebrush on flat terrain.
3. Experimental feeding of 100 antelope snowbound in the Centennial Valley.
  - a. Aerial and sno-cat transportation of hay was used. Both methods appeared too expensive for the amount of hay that antelope will eat. A thaw in the weather came and the antelope moved to where natural forage was available.

Job I-I: Progressing.

1. General inspection by air of Upper Big Hole.
2. Field investigations of deer range in vicinity of Wise River Ranger Station revealed excessive utilization of natural forage and some winter loss was evident.

3. Aerial elk count in Canyon Creek - 168 elk.

Job I-J: Progressing.

1. Shields River antelope count - 126.
2. Field inspection of mule deer in Otter Creek.

Deer are low, several miles from the mountains,  
and are causing damage to private property.

Job I-K: Progressing.

1. The Bull Mountain-Whitetail Creek aerial census  
Job completion report attached.
2. The Crow Creek-Dry Creek aerial elk census.  
Job completion report attached.

Work Plan II: Progressing.

Job II-A: 257 elk ovaries were dissected, project pending  
completion.

- Job II-B:
1. Stillwater River mule deer aging and skeleton  
development; job completion report attached.
  2. Northern Yellowstone elk harvest and "elk  
lift"; job completion report attached.
  3. Six mule deer jaw boards have been made up.

Work Plan III: Progressing.

- Job III-A:
1. Reference is made to Art Brazda's thesis, "Elk  
Migration Patterns and some of the Factors affecting  
Movements in the Gallatin River Drainage", which was  
supervised by J. E. Gaab. Transmitted as soon as  
possible.
  2. Gallatin-Yellowstone elk inter-relationship as  
determined by calf elk tagging.
    - a. 688 calves tagged in the Gallatin since 1938
    - b. 242 calves tagged in the Yellowstone since 1947
    - c. 14 Gallatin tags recovered in Yellowstone
    - d. 22 Gallatin tags recovered in Madison
    - e. 1 Yellowstone tag recovered in the Gallatin



- f. 34 Gallatin tags recovered in the Gallatin this past hunting season
- g. The 22 Gallatin tags recovered in the Madison verify ground observations that appreciable numbers of Gallatin elk winter in the Madison (Bear Creek - Mill Creek area)
- h. 14 Gallatin elk recovered in the Yellowstone represents two percent of those tagged. The Gallatin elk herd is kept at as close to 1500 animals as possible. Two percent of the herd of 1500 represents 30 Gallatin elk harvested in the Yellowstone each year.
- i. One Yellowstone elk recovered in the Gallatin represents .4 percent of those tagged. With equal numbers of 1500 in the herd the Yellowstone is losing six elk a year to the Gallatin.
- j. The relationship of Gallatin elk to the Yellowstone is five times greater or amounting to 24 elk per year as indicated by tag returns.

Job III-B: Inactive during this report period.

Job III-C: To be reported upon completion of Work Plan I, Job I-D.

Job III-D: Inactive during this report period.

Job III-E: Inactive during this report period.

Work Plan IV: To be revised.

Work Plan V: Inactive.

Work Plan VI: Progressing.

Job VI-A: Moose census Red Rock Refuge area. Job completion report attached.

Work Plan VII: Progressing.

Job VII-A: Mid-winter aerial goat census in Crazy Mountains.

113 goats observed distributed throughout the extent of the Crazy Mountain range

This aerial survey is the first of a series of goat censusing methods to be tested by Jack Lentfer, Montana State College graduate student for his Master's thesis.

Habitat requirements for goats is to be reported on by Jack Saunders, Montana State College graduate student for his Master's thesis.

Work Plan VIII: Progressing.

Job VIII-A: 39 Rocky Mountain sheep observed in Stillwater Canyon opposite the Beartooth ranch incidental to mule deer range inspection. Five lambs were positively identified and appeared to be in poor physical condition.

Job VIII-C: 15 Rocky Mountain sheep were observed in Squaw Creek (Madison River) incidental to an elk census.

Work Plan IX :

- Job IX-A: 1. Four areas were inspected as potential elk transplanting sites.
- a. Hells Canyon - not recommended - substantial numbers present.
  - b. Mill Creek (Anaconda) - recommended for 50 elk.
  - c. Moose Camp Creek - not recommended - substantial numbers present.
  - d. Red Lodge Creek - Rock Creek area - recommended for 50 elk.

Submitted by:

Approved by:

Name J. E. Gaab

Montana State Department of Fish & Game

Title Biologist

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 35-R-3      Work Plan No. I      Job No. I-B

Title of Job: Big Game Survey in Blacktail

OBJECTIVES:

Determine current big game population and distribution on this important game range. Records of weather, game conditions and other critical information will be taken to correlate with census data. Management recommendations will be submitted from current findings.

PROCEDURE: Aerial census

FINDINGS:

1. One thousand two hundred and thirty-one elk were counted on the west slope of the Snow Crest Mountains and Blacktail Ridge.
2. Four hundred of these animals are concentrated at the mouth of the East Fork of the Blacktail.
3. Wintering conditions excellent.

RECOMMENDATIONS:

1. The concentration of elk wintering at the mouth of East Fork should be broken up. A short branch antlered bull season followed by a few days hunters choice in Blacktail drainage may only tend to spread these elk.

Submitted by J. E. Gaab

Approved by Robert F. Cooney

Date April 9, 1952





JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 35-R-3      Work Plan No. I      Job No. I-E

Title of Job: Big Game Survey in East Side Madison

OBJECTIVES

Determine current big game population and distribution on this important game range. Records of weather, game conditions and other critical information will be taken to correlate with census data. Management recommendations will be submitted from current findings.

A migration of elk from the Gallatin into the Madison occurs usually in late December or early January. The extent of this migration is determined by censusing before and after it occurs.

PROCEDURE:

1. A ground count of native elk is made before migration occurs.
2. Complete aerial coverage is made when migration is completed.
3. Total elk numbers are recorded annually, deer concentration trends and winter range conditions observed.

FINDINGS:

1. On December 7, 1951 seventy-eight native elk were counted from Tollman Creek to Bear Creek.
2. On March 14, three hundred and sixty-six were counted from Tollman to North Indian.
3. The migration amounted to two hundred and eighty-eight elk.
4. Sixty-six additional elk were counted on the east side of the Madison.
5. Total elk wintering on the east side - four hundred and thirty-two.
6. Deer concentrations comparable with the usual.
7. Deep snow line pinching down elk range to where some animals took refuge on private land.

RECOMMENDATIONS:

1. Annual censusing continue.
2. Every effort should be made to acquire elk range in this vicinity by land acquisition, (Project No. 44-L)
3. No change to be made in management.

SUMMARY:

Without elk range to provide for the naturally migrating elk into the Bear Creek area, the Gallatin elk will necessarily have to be held at a minimum. The extent of this migration is in proportion to the size of the Gallatin herd. The migration occurs annually unless subnormal weather conditions provide available forage in Taylor Fork (Gallatin) and the Gallatin elk herd is below fifteen hundred head.

Submitted by J. E. Gaab

Approved by Robert F. Cooney

Date April 9, 1952

JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 35-R-3 Work Plan No. I Job No. I-E

Title of Job: Big Game Survey in West Side Madison

OBJECTIVES:

Determine current big game population and distribution on this important game range. Records of weather, game conditions and other critical information will be taken to correlate with census data. Management recommendations will be submitted from current findings.

PROCEDURE:

1. Aerial elk total census.
2. Ground and aerial deer concentrations observed.
3. Range condition investigation in key areas.

FINDINGS:

1. One hundred and thirty-three elk - Horse Creek to Wigwam Creek
2. Eighty-three elk in West Fork of Madison - Elk Lake and Long Creek
3. Forty-two elk in Ruby River (Warm Spring Creek)
4. Deer concentrations comparable to last year.
5. No range condition inspection made during this quarter.

RECOMMENDATIONS:

1. No change in management.

SUMMARY:

Populations remained the same, management practices have not allowed populations to get out of bounds.

Submitted by J. E. Gaab Approved by Robert F. Cooney

Date April 9, 1952



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 35-R-3

Work Plan No. I

Job No. I-K

Title of Job: Bull Mountain - Whitetail Creek Aerial Elk Census

OBJECTIVES:

Determine current big game population and distribution on this important game range. Records of weather, game conditions and other critical information will be taken to correlate with census data. Management recommendations will be submitted from current findings.

PROCEDURE:

1. On March 27, following a light snow early in the morning, a total coverage of Bull Mountain and Whitetail Creek drainage was accomplished.

FINDINGS:

1. Location of elk counted

|                            |          |
|----------------------------|----------|
| a. Ratio Mountain          | 51       |
| b. Pony Creek              | 32       |
| c. Fletcher Hill           | 30       |
| d. Beacon Hill             | 5        |
| e. East side Bull Mountain | 67       |
| f. Jack Creek              | <u>7</u> |

Total            192 elk

2. Trails from the west side of Bull Mountain were observed crossing the head of Whitetail Creek.
3. Elk in good physical condition and wintering conditions appeared excellent.

RECOMMENDATIONS:

1. There is the necessity for closer sportsman-rancher-Department relations concerning this small elk herd.
2. Harvest would best be accomplished on a special permit basis.

Submitted by J. E. Gaab

Approved by Robert F. Cooney

Date April 9, 1952





JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 35-R-3      Work Plan No. I      Job No. I-K

Title of Job: Crow Creek - Dry Creek Aerial Elk Census

OBJECTIVES:

Determine current big game population and distribution on this important game range. Records of weather, game conditions and other critical information will be taken to correlate with census data. Management recommendations will be submitted from current findings.

PROCEDURE:

On March 22, 1952, after a fresh snow and early in the morning, complete coverage was made from and including Dry Creek to and including Indian Creek.

FINDINGS:

1. One hundred and fifteen elk were counted on Crow Creek drainage.
2. The elk were in bands of five to thirty, mostly in the vicinity of Slim Sam Creek.
3. Physical condition and wintering conditions appeared excellent.

RECOMMENDATIONS:

1. There is the necessity for closer sportsman-rancher-Department relations concerning the welfare of this small herd of elk.
2. Harvest may best be accomplished on a special permit basis.

Submitted by J. E. Gaab      Approved by Robert F. Cooney

Date April 9, 1952



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 35-R-3      Work Plan No. II      Job No. 2-B

Title of Job: Stillwater River Mule Deer Aging and Skeletal Development

DATE: November 1 - November 7, 1951

PERSONNEL:    Dr. E. L. Cheatum, Montana State University  
                 Phil South, Student Assistant, Montana State College  
                 John Rose, Student Assistant, Montana State College  
                 J. E. Gaab, Biologist

OBJECTIVES:

To determine herd age composition and skeletal development.

PROCEDURE:

The area studied is a migration neck between high mountain summer range and foothill winter range. This was the third either sex season in this area. The area had been subjected to heavy buck hunting for two weeks before this study. Aging and measurements was done at a game checking station. Aging was done by tooth displacement and wear. No known-age jaws were available. A collection of jaws was made and they were categorized by comparison.

FINDINGS:

1. Total harvest of mule deer

|              |           |
|--------------|-----------|
| Adult male   | 90        |
| Adult female | 220       |
| Young male   | 59        |
| Young female | 82        |
| Spikes       | <u>17</u> |

|       |     |
|-------|-----|
| Total | 468 |
|-------|-----|

2. Hunter success

30.53 % of hunters in the area were successful

3. Summary of daily kill report through the checking station

|            |     |
|------------|-----|
| November 1 | 184 |
| November 2 | 45  |
| November 3 | 98  |

|            |    |
|------------|----|
| November 4 | 72 |
| November 5 | 32 |
| November 6 | 20 |
| November 7 | 17 |
| November 8 | 1  |

4. Residence of successful hunters

64% from Yellowstone County  
 16% from Stillwater County  
 14.9% from Carbon County  
 5.1% from nine adjacent counties

5. Popular gun caliber

The 30-06 was the most popular rifle used, followed by the 30-30, 270, 300 and 22 others.

6. Herd composition

| <u>Age Group</u> | <u>Percent of Herd</u> |               | <u>Age Group<br/>Percent of Herd</u> |
|------------------|------------------------|---------------|--------------------------------------|
|                  | <u>Male</u>            | <u>Female</u> |                                      |
| Fawns            | 16.6                   | 18.2          | 34.8                                 |
| 1½ years         | 13.2                   | 12.8          | 26.                                  |
| 2½ years         | 4.8                    | 11.0          | 15.8                                 |
| 3½ years         | 1.2                    | 7.7           | 8.9                                  |
| 4½ years         | .3                     | 6.8           | 7.1                                  |
| 5½ years         | 0.                     | 3.4           | 3.4                                  |
| 6½ years         | 0.                     | .3            | .3                                   |
| 7½ years         | 0.                     | .3            | .3                                   |
| 8½ - 9½ years    | 0.                     | 1.2           | 1.2                                  |
| 10½ plus years   | 0.                     | 2.1           | 2.1                                  |

- a. It is quite apparent that during the regular buck season very few 1½ year old bucks were taken, as indicated by the nearly equal per cent of 1½ year olds of both sex that were taken during the either sex season.
- b. No bucks over 4½ years old were taken during the hunters choice season, which indicates adequate hunting pressure during the buck season.



c. Sex Ratio

|         | Years of age |    |    |    |    |           |
|---------|--------------|----|----|----|----|-----------|
|         | 1½           | 2½ | 3½ | 4½ | 5½ | 6½ to 10- |
| Males   | 42           | 14 | 4  | 1  | 0  | 0         |
| Females | 41           | 35 | 25 | 22 | 11 | 13        |

Sex ratio of 1 buck to 2.4 does is highly desirable.  
The bucks are of vigorous breeding age.

d. Herd Comparison

Island Lake station (western Montana) white-tailed deer (a)  
Nye station mule deer (b)

| Age     | Bucks |    | Does |    | Total |     |
|---------|-------|----|------|----|-------|-----|
|         | a     | b  | a    | b  | a     | b   |
| Fawn    | 13    | 53 | 11   | 58 | 24    | 111 |
| 1½      | 11    | 42 | 9    | 41 | 20    | 83  |
| 2½      | 2     | 14 | 10   | 35 | 12    | 49  |
| 3½      | 4     | 4  | 3    | 25 | 7     | 29  |
| 4½      | 2     | 1  | 5    | 22 | 7     | 23  |
| 5½      | 1     | 0  | 3    | 11 | 4     | 11  |
| 6½      | 3     | 0  | 1    | 1  | 4     | 1   |
| 7½      | 4     | 0  | 1    | 1  | 5     | 1   |
| 8½ - 9½ | 0     | 0  | 2    | 4  | 2     | 4   |
| 10+     | 1     | 0  | 2    | 7  | 3     | 7   |

One third of the bucks at Island Lake were 5½ years and older; at Nye there were no bucks over 4½ years old. Sex ratio of breeding animals at Island Lake is 1 buck to 1.2 does; at Nye it is 1 buck to 2.4 does.

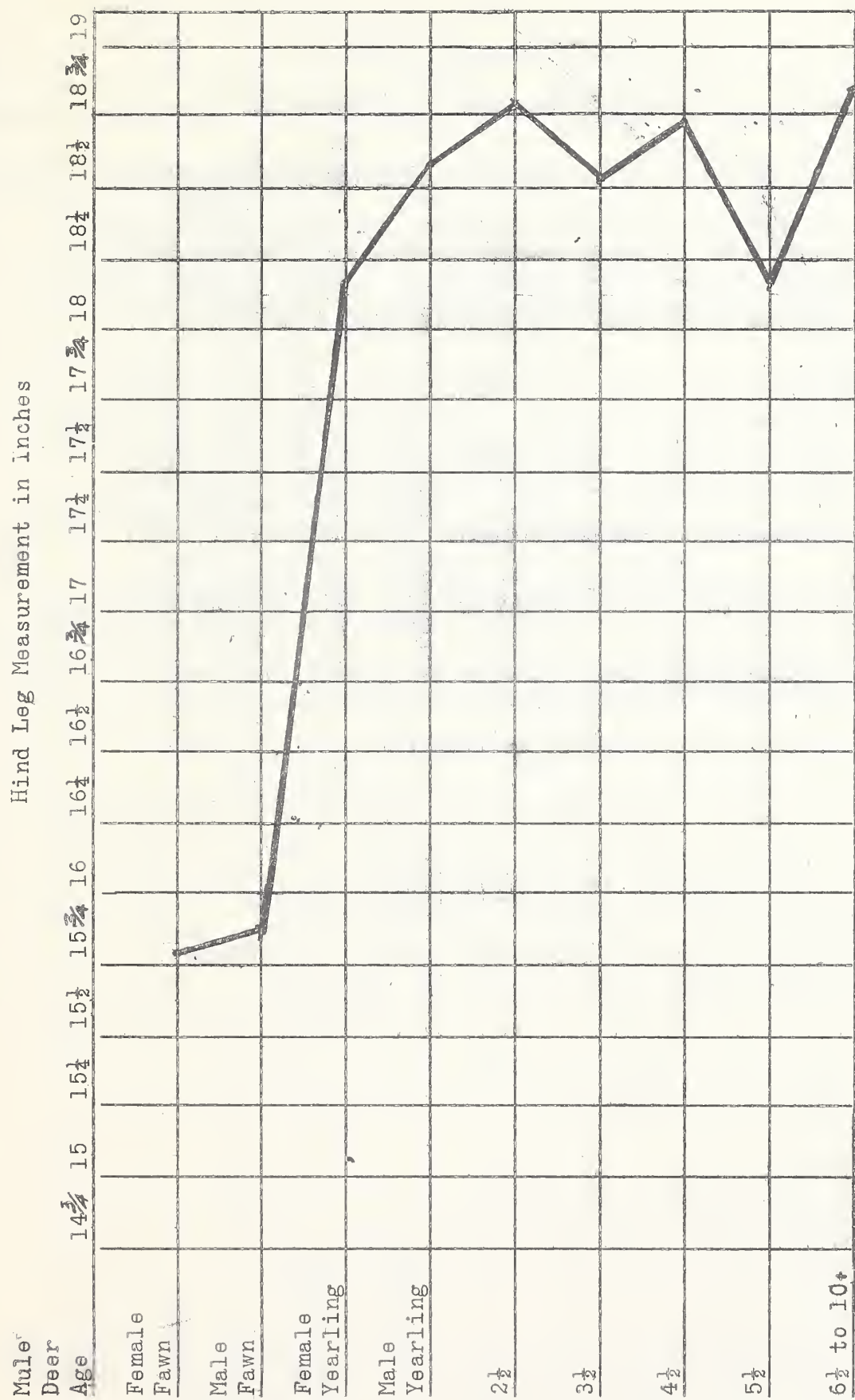
At Island Lake 28% of the breeding herd (excludes fawns) were 5½ years old and older; at Nye only 11% of the breeding herd were 5½ years old and older. In respect to utilized range in animal years the Island Lake range is receiving three times the use in animal years by old

deer as the Nye area. There is proof to substantiate the fact that a young herd all  $5\frac{1}{2}$  years and under will reproduce at a faster rate than a herd with an older average age. Old deer use more animal years toward range over-utilization before they are utilized. Young herds reproduce at a faster rate and by keeping down the life expectancy a good many animal years use of range is saved. Old animals carry more disease and parasites, therefore spreading these malices at a greater rate. Therefore the Nye deer herd is a much more vigorous and healthy herd than the Island Lake deer herd. Optimum utilization is being made of the Nye herd annually and the better range management will perpetuate a larger number of harvestable game over a period of years. Annual increase as indicated from the Island Lake station is about 24% as compared to 34.8% from the Nye station. These figures would necessarily have to be compensated to include bucks harvested from each herd previous to the hunter choice season. No check was made of bucks harvested during the pervious buck season so a true increase figure is not obtainable. However, the two figures indicate that the Nye herd is most productive.

7. Mule deer skeletal development at Nye, Montana, using hind leg measurements as a key. (Measurement point of hock to point of toe.)

\* \* \* \* \*

The chart on the following page indicates that full skeletal development is reached at the age of  $2\frac{1}{2}$  years. The sample from  $3\frac{1}{2}$  years and older is so small and predominantly females, further development is not indicated. If equal numbers of each sex in each age group could be had the life span curve of skeletal development could be drawn.



Mule Deer Skeletal Development at Nye, Montana, using hind leg measurements as a key (measurement point of hock to point of toe).

CONCLUSIONS:

1. Hunting pressure in the Nye area came from Yellowstone County.
2. The Nye deer are a vigorous, healthy, highly productive herd.
3. The herd composition indicates proper utilization with simultaneous range management. Keeping the population in balance with the availability of natural forage lessens damage to private property.

RECOMMENDATIONS:

1. Hunter harvest comparable to the 1951 season should be accomplished in future years.
2. Every third year comparable data should be collected and a brief range examination made.

Submitted by J. E. Gaab

Approved by Robert F. Cooney

Date April 15, 1952

JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 35-R-3      Work Plan No. II      Job No. II-B

Title of Job: Northern Yellowstone Elk Harvest and "Elk Lift"

Date: October 15, 1951 - January 31, 1952

Personnel: Deputy Warden Force  
Yellowstone Park Officials  
Absaroka Conservation Committee  
Gardiner Businessmen  
Gene Sherman, Game Warden Supervisor  
Jack Waynard - Checking Station Operator  
Norman Wortman - Checking Station Operator  
J. E. Gaab, Big Game Biologist

Objective: To affect the elk harvest necessarily set by the Absaroka Conservation Committee recommended by the Park Service.

1. The changes in the regular hunting area at Gardiner were as follows:
  - A. The area termed "Decker Flat" was made a Game Preserve.
  - B. The hunting boundary was made along the Jardine-Gardiner road and down the highway to the South boundary of the Tony Stermitz ranch and thence to the Yellowstone River. This made the roads a well defined and easily patrolled boundary.
  - C. The area was closed to trespass from 8 P.M. to 8 A.M.
  - D. Shooting hours remained the same from 8 A.M. to 5 P.M.
  - E. Parking lots were made along the roads.
  - F. All roads leading into open hunting territory were blocked from 8 P.M. to 8 A.M. At 8 A.M. all roads were opened.

Conclusion: The methods listed above have a three-fold purpose, namely: To encourage elk to migrate into open hunting territory. To stop elk from returning to closed area once they are in open territory. To give all hunters an equal chance.

These purposes were accomplished and given merit by the hunting public. At least seven wardens are necessary to



conduct this season.

## II. The "Elk Lift"

### Objective:

For the past two years the Park Service has reduced the "interior elk" by direct control measures. Direct control by shooting animals on the open range by Park Officials and selling the carcasses to the Indian agencies and State Institutions received much adverse comment from the public. The Gardiner Rod and Gun Club proposed a plan, sanctioned by the Absaroka Conservation Commission to trap those animals and truck them into open hunting territory during the regular season. The Park service went all out for this plan and this year operated five new elk traps.

### Findings: 1950-1951 program.

1. During the 1950-51 season, 69 elk were lifted from the traps and released in open hunting territory. Twenty-six of these animals were recovered by hunters.
2. Each elk released was ear tagged with a metal numbered tag, and the number, sex, trapping site, release site and release date were recorded.
3. A dab of yellow road striping paint was put on the point of each elk's shoulders.
4. The local sportsmen's organizations defrayed the trucking expenses.

### Conclusion:

1. Due to the small number of elk involved no conclusions were drawn.

### Findings: 1951-1952 program.

1. December 20th the first load of 13 elk was released north of Cinnabar Mountain.
2. The Montana Fish and Game Department furnished hay for baiting purposes at the traps and one truck and driver in addition to trucks furnished by local sportsmen's clubs.
3. All elk released were ear tagged with a metal numbered tag and a strip of green automobile lacquer was made across each elk's shoulders and down about a foot on each side. The automobile lacquer has more dying qualities than any other paint or dye used. It was necessary to stripe the animals down across the shoulders so they could be readily

detected by checking station personnel. Most hunters haul their bagged animals on their backs to facilitate "airing out". In that position a dab of paint just on the point of the shoulders cannot be seen. Each animal had to be examined by checking station personnel. Hunters would fail to see the metal ear tag and cut the head off. Some wouldn't commit themselves and declare their animal as being painted. With the green stripe down across the shoulders checkers could see it at a glance. Better recovery was accomplished. The metal tag provides the animal's history when or where it may be bagged or retrapped during this operation this year or next or recovered later as a natural migration or winter casualty.

4. The "lifted" elk were classified as calf, mature male, spike, or mature femals. This data plus the date released, trap trapped, area released, ear tag number and description were recorded on a mimeographed form and sent to the checking station. The same form shows the recovery record, date recovered, location and the hunter's checking station card number.

5. January 26th the last load of elk was "lifted" to Ladue Springs.

6. Number recovered in respect to location and date released.

| <u>Date Released</u> | <u>Released<br/>Number</u> | <u>Location</u>   | <u>Recovered</u> |
|----------------------|----------------------------|-------------------|------------------|
| December 20, 1951    | 13                         | Cinnabar Mountain | 10               |
| 21                   | 21                         | LaDue Springs     | 12               |
| 23                   | 24                         | Yankee Jim Canyon | 10               |
| 24                   | 25                         | Corwin Springs    | 13               |
| 24                   | 11                         | Corwin Springs    | 5                |
| 24                   | 6                          | Trail Creek       | 1                |
| 26                   | 18                         | Trail Creek       | 12               |
| 27                   | 19                         | Ladue Springs     | 14               |
| 28                   | 14                         | Rex Coulee        | 6                |
| 29                   | 18                         | Gardiner Area     | 10               |
| 31                   | 6                          | Gardiner Area     | 3                |

| <u>Date Released</u> | <u>Released<br/>Number</u> | <u>Location</u>              | <u>Recovered</u> |
|----------------------|----------------------------|------------------------------|------------------|
| January 2, 1952      | 25                         | Trail Creek & Corwin Springs | 12               |
| 3                    | 19                         | Mouth of Mol Heron Creek     | 9                |
| 4                    | 27                         | Cinnabar Mountain            | 20               |
| 4                    | 24                         | Cinnabar Mountain            | 19               |
| 6                    | 16                         | Mouth of Mol Heron Creek     | 11               |
| 7                    | 10                         | Cinnabar Mountain            | 3                |
| 7                    | 20                         | Cinnabar Mountain            | 11               |
| 7                    | 26                         | Cinnabar Mountain            | 10               |
| 8                    | 18                         | Cinnabar Mountain            | 15               |
| 9                    | 17                         | Trail Creek                  | 0                |
| 10                   | 18                         | Mouth of Mol Heron Creek     | 7                |
| 11                   | 13                         | Trail Creek                  | 9                |
| 12                   | 7                          | Ladue Springs                | 6                |
| 15                   | 12                         | Ladue Springs                | 7                |
| 16                   | 14                         | Cinnabar Mountain            | 4                |
| 16                   | 13                         | Ladue Springs                | 10               |
| 18                   | 4                          | Mouth of Mol Heron Creek     | 1                |
| 18                   | 24                         | Mouth of Mol Heron Creek     | 13               |
| 19                   | 24                         | Phelps Creek                 | 10               |
| 21                   | 24                         | Ladue Springs                | 12               |
| 21                   | 14                         | Phelps Creek                 | 8                |
| 22                   | 7                          | Ladue Springs                | 1                |
| 22                   | 13                         | Phelps Creek                 | 3                |
| 22                   | 3                          | Mouth of Mol Heron Creek     | 0                |
| 22                   | 11                         | Mouth of Mol Heron Creek     | 2                |
| 23                   | 7                          | Ladue Springs                | 3                |

| <u>Date Released</u> | <u>Released<br/>Number</u>             | <u>Location</u>                       | <u>Recovered</u> |
|----------------------|--|---------------------------------------|------------------|
| 23                   | 13                                     | Ladue Springs                         | 6                |
| 24                   | 8                                      | Ladue Springs                         | 0                |
| 25                   | 14                                     | Ladue Springs                         | 12               |
| 26                   | <u>10</u>                              | Ladue Springs                         | <u>2</u>         |
| Total Released       | 630 - 1 (Repeater) Sub-Total Recovered |                                       | 323              |
|                      |  | Just Green Paint &<br>Unaccounted for | <u>22</u>        |
|                      |  | Total Recovered                       | 345              |

Total releases 630 minus 1 equals 629.

2750 elk checked at checking station  
345 elk presumed killed and not checked

$\frac{345}{2750}$  equals  $\frac{x}{345}$ ; x equals 43 elk presumed harvested and not  
recorded on basis of checking  
station misses

sub-total recovered 323

just green paint and  
unaccounted for 22

total recovered 345

presumed harvested  
(see above) 43

total and estimated  
recovery 388

Elk lifted the second time 12 cases

total individual elk 629 - 12 equals 617

$\frac{388}{629}$  equals 62% harvest success of total "lift" operation.

$\frac{388}{617}$  equals 63% harvest success on 617 individual elk  
handled with 12 cases of repeat hauling.

7. A total of 21 cases of elk returned to the Park and being  
retrapped. Twelve were relifted and 9 transplanted in other  
areas in the State.

8. Percent recovery from each release site.

| <u>Area released</u>       | <u>No. released</u> | <u>No. recovered</u> | <u>% recovered</u> |
|----------------------------|---------------------|----------------------|--------------------|
| Ladue Springs              | 166                 | 86                   | 51                 |
| Cinnabar Mountain          | 152                 | 92                   | 60                 |
| Mouth of Mol Heron Creek   | 95                  | 43                   | 45                 |
| Trail Creek                | 54                  | 22                   | 40                 |
| Yankee Jim Canyon          | 24                  | 10                   | 41                 |
| Corwin Springs             | 36                  | 18                   | 50                 |
| Rex Coulee                 | 14                  | 6                    | 42                 |
| Gardiner Area              | 24                  | 13                   | 54                 |
| Trail Creek & Corwin Spgs. | 25                  | 12                   | 44                 |
| Phelps Creek               | 51                  | 21                   | 41                 |

9. Terrain and weather conditions affecting recovery of lifted elk. The elk were released shortly after 5 p.m. and weren't hunted until 8 a.m. These animals of course would go to the nearest timber for cover. The lower margin of the timber along the Yellowstone River is an average of about a mile or more from the river. The snow in the timber was three and four feet deep and deeper higher up the slopes. For that reason when elk were migrating out at lower levels and available to hunters the hunters weren't anxious to follow the lifted elk through deep snow. A good many natural migrating elk took refuge in these areas also. For this reason up until the last ten days of the season the recovery of lifted elk was only thirty to forty percent. The last few days of the season when the number of natural migrating elk dropped off and hunters became more desperate, the more ardent hunters started into the timbered areas to hunt and consequently the recovery of lifted elk increased.

10. Economic aspect - cost. State furnished a truck and driver. About \$.75 per elk.

Conclusions:

1. The Park Service trapping methods are effective and elk can be supplied in sufficient numbers to use this method of management as a tool of harvest by hunters.
2. The recovery isn't as high as could be expected to make this



operation most effective. However, the present effectiveness of this project indicates that it may well become a long-term operation.

Recommendations:

1. That the State Fish and Game Department continue to cooperate by furnishing hay for baiting purposes at the elk traps and provide one man and truck to haul elk.
2. That the State Fish and Game Department consider building one or more holding corrals at release sites so elk can be released at any time to increase the recovery.

Submitted by J. E. Gaab Approved by Robert F. Cooney

Date April 15, 1952

Note: There was no special time or any funds spent by the Wildlife Restoration program on this "elk lift" project. Incidental observation was made, however, in conjunction with other regular project and big game work in that area. The included analysis and summary was made and submitted as it is felt that this type of management is quite unique and might be of some general interest.

Robert F. Cooney, Director  
Wildlife Restoration Division



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana  
Project No. 35-R-3 Work Plan No. VI Job No. VI-A  
Title of Job: Moose Census Red Rock Refuge Area

OBJECTIVES:

Census moose in all important areas and determine their year round range.

PROCEDURE:

1. On February 15, 1952, a mid-afternoon aerial census was made.
2. All of the Willow areas from about five miles below the Refuge boundary to the upper limits of the Refuge were covered.
3. Having the advantage of a fresh snow to obliterate old signs, the coverage was made at about three hundred feet from the ground.

FINDINGS:

1. Seventy moose were observed.
2. Haystack damage was obvious, as many as four moose were found bedding on half hauled haystacks.
3. Eighteen moose were bedded within a twenty yard radius.
4. By flying low and slow about thirty feet from the ground in a few instances, heavy utilization of the willow was apparent by the stump appearance of willow clusters.

RECOMMENDATIONS:

1. A harvest of either sex moose during the 1952 hunting season, the number to be removed pending permission for hunters to enter the Refuge to bag an animal.

Submitted by J. E. Gaab Approved by Robert F. Cooney

Date April 9, 1952



|             |                |
|-------------|----------------|
| STATE       | Montana        |
| PROJECT NO. | 37-R-3         |
| DATE        | April 15, 1952 |
| VOL.        | III            |
| NO.         | I              |

QUARTERLY PROGRESS REPORT FOR

SURVEYS AND INVESTIGATIONS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Game Range Predevelopment Survey

2. Personnel: Richard L. Hodder, Leader  
Range Biologist

Carter Rubottom  
Technical Assistant

3. Report of Progress: .

The Gallatin Winter Game Range Survey is in the final phase of completion. Animal months of forage available during the four winter months of the "average winter" are now being computed and should be finished in the near future.

Seed analysis for germination and purity of native seed collected from the winter range is now in process at the State Seed Laboratory. Seeds of some fifteen species of creeper and trailing vine types of vegetation are now being obtained for trial plantings on the winter range this spring. These plants will be put out in the better sites above the eroding slopes. It is hoped that some of these creepers will extend their growth downhill and cover some of the exposed soil below.

Winter range use by the elk was mapped for each month of the winter. The use during this most severe winter in the Gallatin varied markedly from the usual pattern for during much of the winter calves were confined by the deep snow and separated from the more mature animals. Unusually heavy use was made of timbered areas and north slopes rather than the open types on southern exposures.

The plant specimens collected during the past two years were mounted as standard botanical mounts with genus and species covers assembled for the herbarium. Herbarium cases are on order but have not yet been received.



Stomach samples were collected from hunter-killed, road-killed, and winter-killed elk throughout the winter so that a series of paunch samples were obtained, analysis of which should show the variation in species of forage eaten by elk as this severe winter progressed. Caution had to be exercised in obtaining samples after January 15, as hay was available to many elk from that period on. Analysis of the paunch samples is now in progress.

Submitted by:

Name R. L. Hodder

Title Range Biologist

Approved by:

Montana State Department of Fish & Game

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952

|             |                |
|-------------|----------------|
| STATE       | Montana        |
| PROJECT NO. | 38-R-3         |
| DATE        | April 15, 1952 |
| VOL.        | III NO. I      |

QUARTERLY PROGRESS REPORT FOR  
SURVEYS AND INVESTIGATIONS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Upland Game Bird Survey and Investigation
2. Leader: Wm. R. Bergeson, Biologist
3. Report of Progress:

Work Plan I: Preliminary Investigation of Pheasant Habitat Development Possibilities  
Inactive during report period.

Work Plan II: Management Study of Prairie Grouse

Job II-A: Determine Range and Distribution of Prairie Grouse  
Proceeding according to schedule.

Job II-B: Detailed Studies of Population Trends and Breeding Potential  
Progress report attached.

Job II-C: Experimental Management Areas  
Proceeding according to schedule.

Job II-D: Effect of Civilization and Agriculture on Prairie Grouse  
Inactive during report period.

Job II-E: Needs for Habitat Development  
Inactive during report period.

Job II-F: Study of Life History and Biology of Prairie Grouse  
Proceeding according to schedule.

Work Plan III: Management Study of Mountain Grouse

Job III-A: Determine Range and Relative Density  
Proceeding according to schedule.

Job III-B: Experimental Management Areas  
Inactive during report period.

Job III-C: Ecology and Life History of Mountain Grouse  
Inactive during report period.

Work Plan IV: Ring-necked Pheasant Survey and Investigation,  
State-wide

Job IV-A: Study of Breeding Populations and Pheasant  
Production

Proceeding according to schedule.

Job IV-B: Pre and Post Season Sex Ratios and Hunter Harvest  
Writeups in progress.

Job IV-C: Post Card Survey of Hunter Harvest  
Inactive during report period.

Job IV-D: Study of Pheasant Mortality and Causes  
Inactive during report period.

Work Plan V: Survival Value of Game Farm Reared Exotics

Job A: Survival of Valley Quail - Moiese Valley  
Progress Report Attached.

Job B: Survival of Spring Released Hen Pheasants  
Proceeding according to schedule.

Job C: Survival of Chukar Partridges  
Proceeding according to schedule.

Work Plan VI: Ecological Study of Ring-necked Pheasants in  
Flathead Valley

Job VI-A: Changes in Land Use in Flathead Valley  
Proceeding according to schedule.

Job VI-B: Effect of Land Use on Pheasant Production  
Proceeding according to schedule.

Job VI-C: Value of Sanctuaries in Flathead Valley Pheasant  
Production  
Proceeding according to schedule.

Job VI-D: General Ecology and Life History of Ring-necked  
Pheasant  
Proceeding according to schedule.

Submitted by:

Approved by:

Name Wm. R. Bergeson

Montana State Department of Fish & Game

Title Biologist

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952

PROJECT 38-R-3

WORK PLAN NO. II

JOB NO. II-B

TITLE: DETAILED STUDIES OF POPULATION TRENDS AND BREEDING POTENTIAL

PERSONNEL: Don L. Brown, Biologist  
Robert L. Eng, Jr. Biologist

PURPOSE:

In an effort to develop better methods for detecting fluctuations in sage grouse populations, an aerial strip census was initiated on an experimental area for gathering winter trend figures. These data will be used with courtship ground, road, and brood counts from the same area.

PROCEDURE:

The area selected for trend area is shown with flight strips in Figure 1. The area is approximately thirteen thousand square miles in size and is largely grazing land of sagebrush type.

Previous to flying predetermined strips on the trend area, flights were made over sage grouse areas in an attempt to determine the effects of various conditions such as snow cover and time and type of day on the reactions of the birds.

The flight strips were determined and plotted on a map of the area on the basis of equal coverage and land marks which could be located from the air.

While flying the strips, an altitude of less than fifty feet was maintained with the exception of time while over small areas of timber and rough terrain.

From observations made on preliminary flights, it was decided to place birds observed into one of three flushing distance\* categories: within  $\frac{1}{4}$ ,  $\frac{1}{4}$  to  $\frac{1}{2}$  and over  $\frac{1}{2}$  mile. With the exception of large flocks overlapping into the latter category, it is believed that  $\frac{1}{2}$  mile is beyond the distance of effective flushing and observing.

A Super Cub 105 and a Cessna have been used for flying this type of strip, the cub being the more preferred due to its allowances for greater visibility and its capabilities for slower flight.

FINDINGS:

The strips were flown on March 6, 1952, from 9:40 A. M. until 1:15 P. M. Snow cover was near complete, the exceptions being a few wind blown slopes. Sage brush protruded from the snow in most of the area.

\*Distance from line of flight.

Table I shows the average number of sage grouse observed/mile flown and the flushing distances of the birds. The seemingly effective width of the flight strip being  $\frac{1}{2}$  mile, an area of 107.5 miles (8% of total trend area) was censused with an average of 5.6 birds flushed/square mile. These data suggest that approximately seventy three hundred grouse were present on the trend area.

TABLE I. Number of Sage Grouse Observed/Mile of Strip Flown.

| Strip number | Length of strip | Total Number birds observed | Flushing Distance |                               |                    | Average/mile strip |
|--------------|-----------------|-----------------------------|-------------------|-------------------------------|--------------------|--------------------|
|              |                 |                             | 0- $\frac{1}{4}$  | $\frac{1}{4}$ - $\frac{1}{2}$ | Over $\frac{1}{2}$ |                    |
| I            | 37              | 0                           | 0                 |                               |                    | 0                  |
| II           | 34              | 116                         | 116               |                               |                    | 3.4                |
| III          | 34              | 96                          | 96                |                               |                    | 2.8                |
| IV           | 33              | 4                           | 4                 |                               |                    | .1                 |
| V            | 34              | 354                         | 354               |                               |                    | 10.4               |
| VI           | 36              | 42                          | 42                |                               |                    | 1.2                |
| VII          | 7               | 0                           | 0                 |                               |                    | 0                  |
| TOTAL        | 215             | 612                         | 612               |                               |                    | 2.8                |

An attempt to repeat a count on these strips was made on March 15, 1952, but was not completed as the snow cover was about one-half and considered insufficient to allow accurate observation. The flocks which were flushed and counted gave the indication that a break-up of larger winter concentrations had occurred between the two dates (Table II). These data correspond with the first reported activity of these birds on courtship grounds which fell into this period.

TABLE II. Comparison of Flock Sizes.

|                      | March 6, 1952 | March 15, 1952 |
|----------------------|---------------|----------------|
| No. of birds counted | 611           | 212            |
| Max. number in flock | 220           | 47             |
| Min. number in flock | 4             | 4              |
| Average No./ flock   | 76.4          | 21.2           |



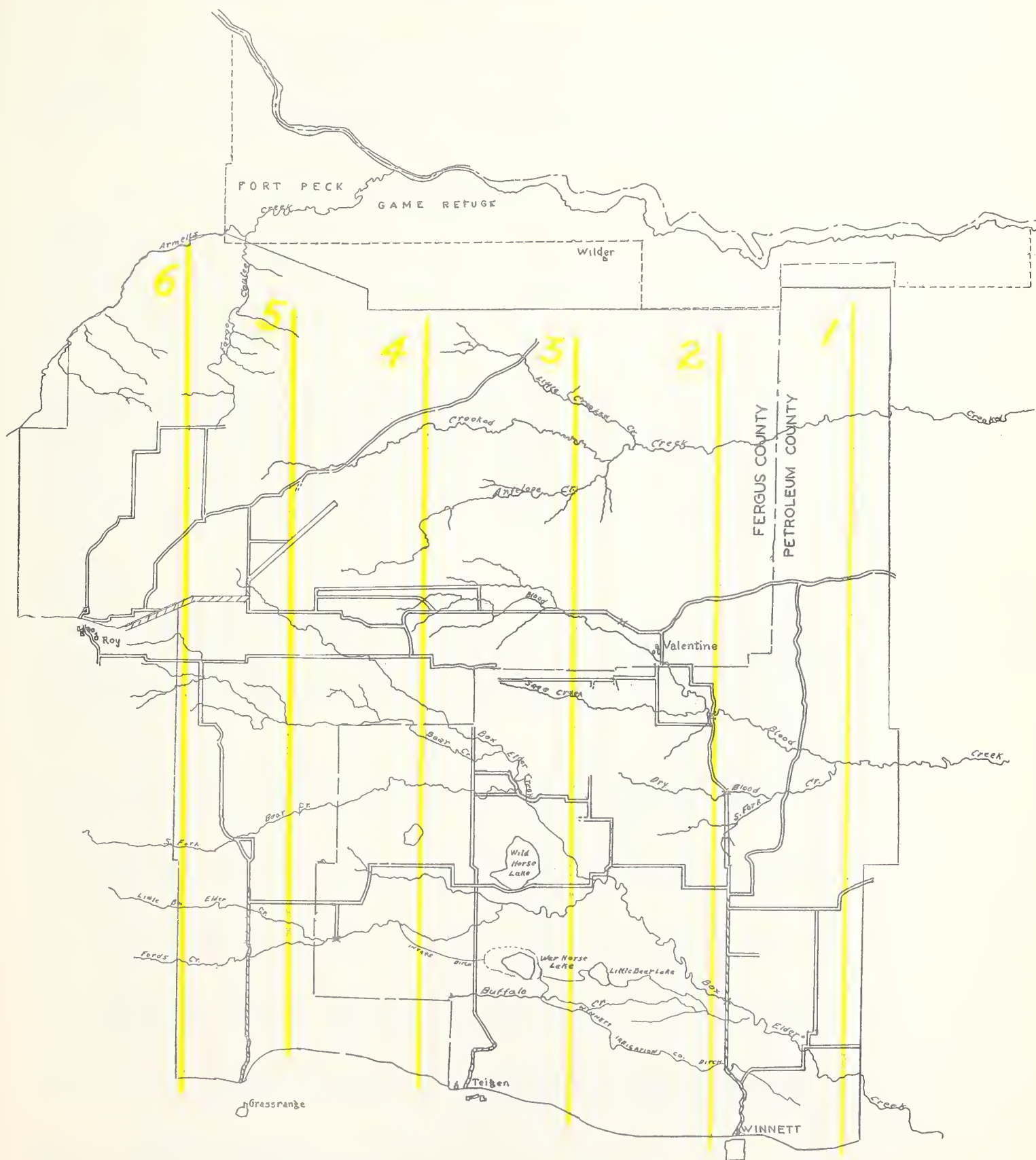


Figure 1. Sage grouse trend area showing flight strips.

Flight lines.



The birds generally flushed ahead of the plane and flew parallel or at a slight angle to the line of flight, thereby allowing accurate counts by both the pilot and observer.

The importance of snow cover is placed on the more willingness of the birds to flush under such conditions and that they are more easily counted against the contrasting background. Several ground observations have shown that at the approach of an eagle the birds will take flight very readily from a snow cover, but tend to squat when on bare ground.

The time and type of day appears not to be too restrictive. The birds seemed to flush equally as well from early morning until mid-afternoon, before they began going to roost. One flight made one and one-half hours before sunset found some of the birds in the snow at the base of sage brush plants and reluctant to flush. Preliminary ground work to coincide flights over an area with feeding periods would help to standardize this variable.

The validity of this type of trend data, or the feasibility of applying such figures on a birds/mile basis, is at present questionable. It does provide a much larger sample over a greater area in a shorter time than with methods used previously in this State. Its value will be more clear in another year when the strips can be periodically checked against each other under similar conditions, and when other trend figures from the same area are available for comparison.

#### SUMMARY:

Two hundred and fifteen miles were flown over an experimental trend area on March 6, 1952, in an attempt to census sage grouse by an aerial strip method. A second flight of the same strips was started on March 15, 1952, but discontinued due to non-comparable conditions.

On the first flight, a total of 612 grouse were flushed and counted within one quarter mile of the flight strip, giving an average of 2.8 birds/mile flown or 5.6/square mile.

Observations indicate that birds are more prone to flush and are therefore more easily counted with a complete snow cover.

Flights should be made to coincide with feeding periods of the birds for standardization as to time of day for flights.

Additional data to check against and compare with these data are needed to determine their value.

Submitted by Robert L. Eng                      Approved by Wm. R. Bergeson

Date April 10, 1952 .



PROJECT 38-R-3

WORK PLAN NO. V

TITLE: SURVIVAL OF VALLEY QUAIL RELEASED IN THE MOIESE VALLEY

PERSONNEL: Fred Hartkorn, Jr. Biologist  
Wesley Woodgerd, Student Assistant  
Seventeen members of the Wildlife Club, University of  
Montana  
Interested sportsmen and their hunting dogs.

DATES: February 5 - 15, 1952

INTRODUCTION:

In March, 1949, twelve pairs of valley quail from the Oregon State Game Farm at Hermiston, Oregon, were released in the Moiese Valley of Lake County. In March, 1951, sixty valley quail that had been live-trapped near Pendleton, Oregon, were released in the same area. The Moiese area was chosen as the best site for release based on its comparatively mild climate and presence of brushy river-bottom cover needed by quail.

OBSERVATIONS:

Some of the twelve pairs of quail liberated in March of 1949 reproduced as two farmers in the area reported observing quail nests which hatched and it was not uncommon to see quail in the area during the summer, fall and early winter of 1949. However, there were only two people who reported seeing quail in 1950; one of these, A. B. Lott, a farmer in the vicinity reported seeing a group of five to seven during the summer of 1950, and the other was an employee on the L. O. Smith ranch who reported seeing three quail near the townsite of Moiese in April, 1950. It was the opinion of Mr. L. O. Smith, on whose ranch the quail were released, that hawks and owls killed all those on his ranch since he saw none after mid-winter (he found no remains nor saw predators actually kill any quail). Although searches of areas where quail had been reported during the summer and fall were made, no quail or remains of dead quail were ever found during 1950. Thus, it seems that most of these quail and their young failed to survive the winter of 1949-50.

Most of the sixty live-trapped quail released in 1951 were seen by this observer and Smith ranch employees several times after release and no dead quail were found by intensive searches of the area of release. A group of six quail were observed along the river bottom near the mouth of Crow Creek during the spring on frequent occasions. During the summer Mr. Smith reported seeing several groups containing young quail; the Moiese Valley ditch-rider reported two groups of quail in the area between Crow Creek Dam and the river, and these two groups were observed by this observer and others during the fall. Hunters reported observing quail in the Moiese area and it seemed that there were at least five coveys accounted for by their observations. Employees of the National Bison Range, which



adjoins the Moiese area on the south, reported observing one group of six to eight quail along their north fence on several occasions during the fall. One covey of quail was observed in MacDonald basin, about five miles northwest of the release site.

The weather thus far in the Moiese valley has been more severe than normal with considerably more snow than usual. The residents of the area all remarked that there was more snow on the ground for a longer period than they could remember for some years back.

Between February 5 and 15, 1952, most of the residents of the Moiese area were contacted and asked if they had seen any quail after being given a brief description of the valley quail. Mr. Schwartz, manager of the Bison Range, reported that he had never observed any quail on the Bison Range or in the Moiese area. Mr. Cy Young reported observing a group of about nine near the L. O. Smith ranch in mid-January. Mr. L. O. Smith reported that he had seen no quail or heard his employees speak of seeing any quail since December. Several people contacted reported observing quail during the fall but most of the farm residents reported they had never seen any quail.

On February 10, 1952, a group of seventeen members of the Wildlife Club at Montana State University helped to make a "mass coverage" of the lower Crow Creek area and the area from the Smith ranch to Moiese. In all about ten miles of creek and river bottom land where quail had been observed during the summer and fall was covered with men spread out from 25 to 100 feet depending on the terrain. Four hunting dogs were also used. Although a fair number of pheasants and several huns were flushed no quail or remains of dead quail were found. An unidentified farmer told one of the observers that he had seen "a flock of about twenty" along the road near the west bridge at the south end of the Moiese Valley.

On February 13, 1952, along with two interested sportsmen who own good bird dogs a coverage of the area west of the Flathead River was made and the ranchers in the area contacted. No quail or remains of dead quail were observed. Mr. Nye, the chief land owner on the west side of the Moiese Valley, reported observing a group of birds he thought were quail last summer but had seen none since. A woman on the Ebel ranch reported that she had never seen any quail or heard her husband speak of seeing any.

On February 14, 1950, with one sportsman and his bird dog all remaining places where quail had previously been seen or reported seen were checked. Most of the lower aspects of MacDonald basin where a covey of quail were seen on December 4, 1951, was covered with the dog, but no quail found. The area near the west bridge on the south end of the Moiese valley was checked but no quail found. The area along the main ditch at the north end of the Moiese Valley was checked (a sportsman reports observing some there in November) but no quail found.

#### SUMMARY AND CONCLUSIONS:

Twelve pair of valley quail were released in March, 1949, in the Moiese Valley and some reproduction was noted during that summer and fall,

very few of these birds were seen during 1950.

Sixty valley quail were released in March 1951, in the lower Moiese Valley. Coveys of quail were quite frequently observed in the Moiese and lower Crow Creek areas during the summer and fall. One covey was found in MacDonald basin about five miles from the point of release.

Residents of the Moiese area were contacted from February 5-14 and a few reported seeing quail during the summer, fall, and early winter, but no one had observed any recently.

A mass coverage of about ten miles of the river and creek bottom area where quail had previously been seen or reported seen was made on February 10 by eighteen men and four dogs, but no quail were found.

All places not covered by the mass count where quail had been reported seen were checked with the help of sportsmen and their dogs, but no quail were found.

It is still too soon to conclusively predict the success or failure of these quail to thrive in the Moiese area, but considering the negative results of recent searches for them it is indicated that very few if any have survived to date of survey.

Submitted by Fred L. Hartkorn

Approved by Wm. R. Bergeson

Date February 15, 1952



STATE Montana  
PROJECT NO. 39-R-3  
DATE March 31, 1952  
VOL. III NO. I

QUARTERLY PROGRESS REPORT FOR  
INVESTIGATIONS PROJECTS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Waterfowl Survey and Investigation
2. Leader: Wynn G. Freeman, Waterfowl Biologist
3. Report of Progress:

Work Plan I:

- Job I-A: Aerial Waterfowl Census  
Inactive during report period.
- Job I-B: Ground Waterfowl Census  
Inactive during report period.

Work Plan II: Waterfowl Movements and Migration Study  
Job completion report on winter banding attached.

Work Plan III: Study of relationship of Stock Water Reservoirs to Waterfowl Production  
Inactive during report period.

Work Plan IV: Study of Census Methods and Biology of Waterfowl in Flathead Valley  
Inactive during report period.

Work Plan V: Pre-acquisition Study of Freezout Lake  
Job Completion report attached.

Work Plan VI: Pre-acquisition Study of Muddy Creek Area (Cascade)  
Inactive during report period.

Work Plan VII: Pablo Refuge Management Investigation  
Inactive during report period.

Work Plan VIII: Blackfoot-Clearwater Habitat Development Investigation on State Lands  
Inactive during report period.

Work Plan IX: Sun River Habitat Investigations on State Lands  
Inactive during report period.

Work Plan X: Investigation of Potential Waterfowl Habitat  
for Development  
Inactive during report period.

Work Plan XI: Study of Hunter Utilization  
Job Completion report attached.

Submitted by:

Name Wynn G. Freeman

Title Biologist

Approved by:

Montana State Department of Fish and Game

By Robert F. Cooney, Director

Title Wildlife Restoration Division

Date April 15, 1952



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 39-R-3      Work Plan No. II      Job No. I

Title of Job: Waterfowl Movement and Migration Study

OBJECTIVES:

- a. To determine homing instincts of winter resident waterfowl.
- b. To determine longevity of winter resident waterfowl.
- c. To determine variations in the size of populations and the sex ratio of these populations.

TECHNIQUES USED:

The birds concentrate on warm water areas during the winter and are easily trapped. The trap used was a modified winter trap described in Montana's Pittman-Robertson Quarterly dated January - April 1949. An effort has been made to distribute our trapping efforts over the entire State.

FINDINGS:

This winter (1951-'52) only a few birds were banded in the western portion of Montana. At Warm Springs, 151 mallards were banded (Table 1). Near Missoula at the Fry Slough trap, 86 mallards were banded.

The Fort Peck trap in eastern Montana banded 1,333 mallards. This banding was done primarily to determine what portion of the mallards previously banded at Fort Peck are returning.

During the period of February 6-9 in 1952, a total of 1,749 mallards were handled through the trap at Fort Peck. The sex ratios for these ducks may be seen in Table 1. There were 1,245 new bands placed on ducks. Repeats, including ducks that repeated in the trap several times, totaled 231. There were four recoveries from trapping locations other than Fort Peck. A total of 229 mallards, banded here in previous years, returned to the trap.

ANALYSIS AND RECOMMENDATIONS:

The mallards trapped at Fort Peck included 229 returns. These returns are from a total of 6,222 ducks banded at Fort Peck during the period of December 10, 1948 to January 23, 1950 (Table 1).

Fish and Wildlife Service personnel at Fort Peck estimated 15,000

Table 1. An analysis of duck banding during the winter of 1952 in the State of Montana

| Banding Station                           | Ducks<br>Handled | Ducks Banded                    | Period  | Ducks Banded | Sex<br>Ratio | Local<br>Repeats | Sex Ratio<br>of Repeats | Total<br>Returns | Sex Ratio<br>of Returns | Recoveries |
|---|------------------|---------------------------------|---------|--------------|--------------|------------------|-------------------------|------------------|-------------------------|------------|
| M:F                                       |                  |                                 |         |              |              |                  |                         |                  |                         |            |
| Duck Creek<br>at Fort Peck                |                  | Dec. 10, 1948<br>Jan. 23, 1950  | -6222   |              | 303.6:100    |                  |                         |                  |                         |            |
| Duck Creek<br>at Fort Peck                |                  | Dec. 19, 1951 -<br>Feb. 5, 1952 | 88 *    |              | 700:100      |                  |                         |                  |                         |            |
|   | 1711             | Feb. 6-9, 1952                  | 1245 ** |              | 316:100      | 231              |                         | 229              | 1247:100                | 4          |
| Sub Total                                 |                  |                                 | 1333    |              |              |                  |                         |                  |                         |            |
| Warm Springs Game<br>Farm at Warm Springs | 232              | March 2-6,<br>1952              | 151     |              | 180:100      | 81               | 440:100                 | 0                |                         | 0          |
| Fry Slough<br>6 miles west of<br>Missoula | 111              | Feb. 6-28,<br>1952              | 86      |              | 258:100      | 4                | 4:0                     | 21               | 600:100                 | 0          |
| Grand Total                               | 2054             |                                 | 1703    |              |              | 316              |                         | 250              |                         | 4          |

\* Mallards banded by Fish and Wildlife personnel in a small trap.

\*\* Mallards banded cooperatively by State and Federal personnel in a large trap.

mallards wintered at the trapping area during the winter of 1952. Of this total, 1,711 were trapped and processed. One thousand two hundred and forty-five ducks were banded and 229 were returns. These data were analyzed by the Lincoln index as follows:

$$\frac{\text{total population}}{\text{total banded population}} = \frac{\text{unbanded ducks and returns}}{\text{returns}}$$

$$\frac{15,000}{\text{t.b.p.}} = \frac{229 + 1245}{229}$$

$$\text{total banded population} = 2326$$

Thus it is estimated 37% of the 6222 previously banded ducks returned to Fort Peck this winter. In this calculation the few recoveries of ducks banded elsewhere have been ignored. The accuracy of the estimate is also directly dependent upon the accuracy of the total population estimate.

The sex ratio of the ducks when they were banded was approximately three drakes to one hen. The sex ratio of returns from these ducks in 1952 is approximately twelve to one.

It is recommended that this trapping be continued in order to determine the life expectancy of our winter population. Because of light hunter returns from birds banded in the winter, retrapping seems to be the logical method to get band information in usable quantities.

Submitted by Wynn G. Freeman Approved by Robert F. Cooney

Gerald Salinas

Date April 15, 1952



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 39-R-3

Work Plan No. V

Job No. I

Title of Job: Pre-Acquisition Study of Freezout Lake

FREEZOUT (GREENFIELDS) LAKE PROJECT

A study to determine the present waterfowl use and the recreational contribution of Freezout (Greenfields) Lake was initiated in the spring of 1951. The information gained from this study has enabled us to determine some factors limiting waterfowl use and production on the area.

Aerial censuses taken by the Federal Fish and Wildlife Service during the spring migration in recent years indicate that the lake is valuable as a resting area for spring migrants. However, a census taken during the breeding season of 1951 reveals that only 202 breeding pairs were utilizing Freezout (Greenfields) Lake. An additional 64 pairs of breeding ducks were using a marsh area adjacent to the lake. Previous studies in other areas have shown that a large per cent of the ducks reared in an immediate locality are killed by the local hunters. Therefore, one of the ways to better hunting is to increase the number of locally reared ducks. This necessitates an improvement of the breeding and nesting habitat so that more ducks will be induced to remain on the area throughout the breeding season.

The total shoreline of the lake during the summer of 1951 was 19.6 miles. One and nine tenths miles or 10 percent of the lake was bordered by agricultural lands, 10.4 miles or 53 percent prairie grass and 7.3 miles or 37 percent a greasewood-prairie grass combination. The marsh adjacent to lake has a shoreline of 3.5 miles. The number of breeding pairs utilizing the various types of shoreline was as follows: twenty-three or 12 per mile on the agricultural lands, fifty-seven or 5.48 per mile on the prairie grass, one hundred and twenty-two or 16.7 per mile on the greasewood-prairie grass combination and sixty-four or 18.3 per mile of marsh shoreline. The greasewood-prairie grass combination which consists of 37 percent of the shoreline was utilized by 60.4 percent of the breeding pairs; the prairie grass with 53 percent of the shoreline was utilized by only 28.2 percent of the breeding pairs; and the agricultural type with 10 percent of the shoreline was utilized by 11.7 percent of the breeding pairs.

An intensive search for waterfowl nests was conducted to determine the type of cover most heavily utilized for nesting at the present time. A number of representative plots were established. The number of plots in each type corresponded to the percent of the shoreline occupied by each particular cover type. The entire marsh adjacent to the lake was searched as a separate unit to determine its contribution as a nesting area.



Each plot was searched three times during the nesting season to obtain a good sample of nests. A total of 94 nests were found about the lake as follows: two nests or 2.1 percent in agricultural land, twenty or 21.3 percent in prairie grass, and seventy-two or 76.6 percent in the greasewood-prairie grass combination. Fifty-three nests were found in the marsh area. The number of nests found in the shoreline cover types directly correlates with the use by the breeding pairs.

Grazing has practically eliminated all nesting cover on the prairie grass shoreline, and as would naturally follow, very few nests are found in this type. The shoreline bordering the agricultural land has little nesting cover available due to planting operations taking place at this season of the year. The virtual elimination of these two types would make the greasewood-prairie grass combination the most favored for nesting at the present time. Line transects through the greasewood-prairie grass combination show that 79 percent of the type is prairie grass and 21 percent greasewood. Grazing has again eliminated nearly all prairie grass cover in this type. It follows then, that 12.3 miles of shoreline has been practically eliminated from a nesting stand point by grazing and agriculture (prairie grass and agricultural land types) and that 79 percent or 5.8 miles (the prairie grass in the greasewood cover) of the remaining area has also been depleted, leaving only 21 percent of 1.5 miles of fair nesting cover contributed by the greasewood.

The success of the nests that were located is shown in Table I. The nest success in the marsh area (73.58%) is considerably above the success of the nests found in the shoreline types (22.34%). This difference can probably be attributed to the fact that the nests in the marsh are less accessible to most predators because of the water barrier. Predation caused 73.41 percent of the 77.66 percent nest failures in the shoreline types. In a summarization of 22 nesting studies, involving 7,600 nests, it was found that a nesting success of 63 percent could be considered normal. (Kalmbach 1/) The nesting success at Freezout (Greenfields) Lake (40.82%) was considerably below normal. The major cause of nest failure, 44.22 percent, was destruction by skunks.

With the majority of the duck nests concentrated in the greasewood-prairie grass combination, and with only 20.8 percent of the type available as nesting cover, it becomes apparent that a predator, such as the skunk, should be able to find more nests than if the entire shoreline offered uniform nesting cover. By having a uniform nesting cover, there would be a better dispersion of nests over a larger area. In addition, the individual duck would have a better chance to find a well concealed nest site.

Young ducks return to nest at the area on which they were reared. Therefore, when production on an area is lowered because of unfavorable conditions, the total brood stock returning the following year is also reduced. This reduction in size of breeding population is apparently taking place at Freezout (Greenfields) Lake. Observations on the breeding population during recent years have indicated that it has been decreasing in size. The major

1/ Kalmbach, E. R., "Nesting Success-Its significance in Waterfowl Reproduction," Fourth North American Wildlife Conference 1939, pp. 591-602.

factors contributing to this decline as determined by this study are:  
 (1) Heavy grazing pressure is rapidly eliminating the available nesting cover and (2) Along with the elimination of nesting sites there is an abnormally high percent of nest failures due to predation. If this trend should continue, eventually waterfowl production on the lake will decline to the point where its contribution to local hunting will be almost negligible.

Freezout (Greenfields) Lake is approximately thirty-five miles west of Great Falls, the largest city in Montana. Because of its nearness to this high population center it is a popular hunting area. Hunting on the lake was practically discontinued after the first of November due to unfavorable weather conditions, but during the 21 days from the 12th of October to the 1st of November, a total of 786 hunters or 38(37.9) per day utilized the area. The hunters bagged 1,491 ducks and geese, or 1.89 waterfowl per hunter day.

TABLE I

Fate of Nests at Freezout (Greenfields Lake), 1951

| Species | Nests Found in Marsh |                         |                                 |                               |                       |
|---------|----------------------|-------------------------|---------------------------------|-------------------------------|-----------------------|
|         | No. of Nests Found   | No. of Successful Nests | No. of Nests Destroyed by Skunk | Destroyed by Unknown Predator | No. of Nests Deserted |
| Redhead | 18                   | 13                      |                                 |                               | 5                     |
| Mallard | 14                   | 10                      |                                 | 1                             | 3                     |
| Scaup   | 9                    | 8                       | 1                               |                               |                       |
| Pintail | 5                    | 4                       |                                 |                               | 1                     |
| Ruddy   | 4                    | 2                       |                                 |                               | 2                     |
| Teal    | 3                    | 2                       |                                 |                               | 1                     |
| Total   | 53                   | 39                      | 1                               | 1                             | 12                    |
| Percent |                      | 73.58                   | 1.89                            | 1.89                          | 22.64                 |

TABLE I (Continued)

| Species   | Nests Found in Greasewood, Prairie Grass and Agricultural Land |                         |                                 |                               |                                  |                                     |                                |
|-----------|--|-------------------------|---------------------------------|-------------------------------|----------------------------------|-------------------------------------|--------------------------------|
|           | No. of Nests Found   | No. of Successful Nests | No. of Nests Destroyed by Skunk | Destroyed by Unknown Predator | No. of Nests Destroyed by Haying | No. of Nests in Deserted Greasewood | No. of Nests in Grass Ag. Land |
| Gadwall   | 34   | 4                       | 28                              | 1                             | 1                                | 29                                  | 5                              |
| Pintail   | 28   | 12                      | 14                              | 1                             | 1                                | 16                                  | 11                             |
| Teal      | 8  | 1                       | 7                               |                               |                                  | 7                                   | 1                              |
| B.W.Teal  | 9  | 1                       | 6                               | 1                             | 1                                | 7                                   | 1                              |
| G.W.Teal  | 6  |                         | 4                               | 1                             | 1                                | 5                                   | 1                              |
| Mallard   | 3  | 2                       | 1                               |                               |                                  | 3                                   |                                |
| Bald Pate | 2  |                         | 2                               |                               |                                  | 2                                   |                                |
| Shoveller | 2  | 1                       | 1                               |                               |                                  | 1                                   | 1                              |
| Scaup     | 2  |                         | 1                               | 1                             |                                  | 2                                   |                                |
| Total     | 94   | 21                      | 64                              | 5                             | 2                                | 72                                  | 20                             |
| Percent   |  | 22.34                   | 68.09                           | 5.32                          | 2.13                             | 76.6                                | 21.3                           |
|           |  |                         |                                 |                               |                                  |                                     | 2.1                            |



## Recommended Management Plan for Freezout (Greenfields) Lake

Freezout (Greenfields) Lake is potentially one of the better waterfowl producing areas in the State. At the present time production is decreasing. Major factors limiting waterfowl production on the lake are: (1) Heavy grazing pressure is rapidly eliminating the available nesting cover and (2) Along with the elimination of nesting sites there is an abnormally high percent of nest failures due to predation.

Grazing and agricultural use have practically eliminated 18.1 miles of shoreline from a nesting stand point, leaving only 1.5 miles of fair nesting cover for waterfowl. With the majority of the duck nests concentrated in this 1.5 miles of shoreline, it becomes apparent that a predator, such as the skunk, should be able to find more nests than if the entire shoreline offered uniform nesting cover. By having a uniform nesting cover, there would be a better dispersion of nests over a larger area. In addition, the individual duck would have a better chance to find a well concealed nest site. These two factors should materially reduce the amount of predation on the nests.

By increasing the amount of available nesting cover the area should become more attractive to breeding pairs, thereby increasing the total production and the number of ducks available to the local hunter.

It is recommended that a strip of shoreline be protected from grazing so that the natural cover could re-establish itself and provide adequate nesting cover. The protection from grazing would be accomplished by fencing. It is recommended that the strip should extend back from the shoreline a distance of 660 feet. This distance is recommended because the majority of the nests were found within this distance of the Lake. Access lanes for cattle to reach the lake would be provided in agreement with the lessee of the land.

To halt the present trend of declining waterfowl production on Freezout (Greenfields) Lake, we feel that it is necessary to restore adequate nesting cover on the following areas:

Acreages listed are approximations

Area on lake shoreline

|               |        |          |                 |
|---------------|--------|----------|-----------------|
| T 22 N, R 3 W | Sec. 6 | 80 acres | Fay Lear        |
| " " " " " "   | " 7    | 115      | " " "           |
| " " " " " "   | " 19   | 40       | Theodore Kasper |
| " " " " " "   | " 20   | 20       | " " "           |
| " " " " " "   | " 17   | 65       | " " "           |
| " " " " " "   | " 30   | 115      | W. W. Cole      |

|               |                       |          |            |
|---------------|-----------------------|----------|------------|
| T 22 N, R 4 W | Sec. 13               | 30 acres | Ira Fulk   |
| " " " " "     | " 12                  | 120 "    | " "        |
| " " " " "     | " 2                   | 40 "     | Ralph Ross |
| T 22 N, R 3 W | " 18                  | 90 "     | Unleased   |
| " " " " "     | " 19 SE $\frac{1}{4}$ | 15 "     | "          |

Obtain use of the following tracts of shoreline as the present fence arrangement does not make fencing a strip feasible.

|               |                                       |          |                 |
|---------------|---------------------------------------|----------|-----------------|
| T 22 N, R 3 W | Sec. 29                               | 50 acres | Rolland Birdeau |
| " " " " "     | " 30E $\frac{1}{2}$ SE $\frac{1}{4}$  | 50 "     | W. W. Cole      |
| T 22 N, R 3 W | " 19 SW $\frac{1}{4}$                 | 30 "     | C. R. Harris    |
| T 22 N, R 4 W | " 13NW $\frac{1}{4}$ SW $\frac{1}{4}$ | 30 "     | Ira Fulk        |
| " " " " "     | " 1                                   | 30 "     | Ralph Ross      |

Area on marsh shoreline

|               |        |          |            |
|---------------|--------|----------|------------|
| T 22 N, R 3 W | Sec. 7 | 10 acres | Earl Young |
| " " " " "     | " 8    | 50 "     | " "        |
| " " " " "     | " 17   | 45 "     | " "        |
| " " " " "     | " 18   | 10 "     | " "        |

Total acreage 1,035

Total leased acreage 930

Total unleased acreage 105

Prepared by LeRoy Ellig

Approved by Wynn R. Freeman

Date January, 1952



JOB COMPLETION REPORT  
INVESTIGATIONS PROJECTS

State of Montana

Project No. 39-R-3      Work Plan No. XII      Job No. I

Title of Job: Study of Hunter Harvest of Waterfowl

OBJECTIVES:

1. To establish an economical and accurate method of determining the statistics of waterfowl hunting
2. To determine the sex and age composition of the bag of waterfowl
3. To determine the condition of birds at that season of the year

TECHNIQUES USED:

The regular voluntary checking stations were operated again this year. This was the fourth year for these stations. Two additional areas were checked during the initial weekend--the pothole area near Plentywood and Grass Valley near Missoula.

A hunter use and bag check study was made at Freezout Lake, Montana.

Hunters were contacted at the checking stations during the first weekend of the season and postal card questionnaires were sent to a selected group of these hunters at the close of the season.

FINDINGS:

A continuous season totaling fifty days was chosen by the Fish and Game Commission as the 1951 waterfowl hunting season in Montana. The season extended from October 12 through November 30. This provided fourteen more days for hunting than did the split seasons of 1949 and 1950. The bag limit was increased from four to five ducks.

The small water areas in eastern Montana froze over as early as October 15. This resulted in an extremely short hunting season in this area. The hunters feel, however, that it was a good season while it lasted.

In western Montana, the weather was fair and the migration failed to give the appearance of a "heavy flight". Hunting was reasonably productive

in view of weather conditions.

A majority of the waterfowl hunters were well satisfied. They are in favor of a straight season as compared with a split season. This has been determined through personal contact at the checking stations, from postal card inquiry, and from warden reports.

The pheasant hunting season extended from Sunday, October 28 through Monday, November 12. During this period, duck hunting was combined with pheasant hunting in most areas.

There was a total 33,471 duck stamps sold in Montana during 1951. This was an increase of 2,613 duck stamps sold over the 1950 sale.

According to our checking stations, the average number of birds taken per trip to the field decreased from 1.9 in 1950 to 1.7 in 1951. This figure is a comparison of the average bag for total checks made during the 1950 split season and the 1951 straight season. A more directly comparable set of data are the average bags for the opening weekends. This comparison shows a slight decrease for three areas, (Great Falls, Blackfoot, and Flathead) and a slight increase for one area, the Bitterroot (Table 1).

The number of hunters checked through the regular checking stations during 1951 was 1,658. This was a decrease of 251 from the 1,909 hunters checked in 1950.

A large portion of the hunters were checked through the checking stations during the 1951 season, during the first weekend of operation. Thirty-seven and seven tenths percent of the total hunters and 53.3 percent of the total birds were examined the first weekend (Table 2).

The species composition at all checking stations remained basically the same during the four years of operation. Green-winged teal provided a larger percent of the total kill registered at the Flathead Station this year. Also apparent in the Flathead data, was a decrease in the percent of mallards. Some of this decrease may have resulted because fewer hunters were checked late in the season. A very high percentage of mallards is to be expected in the bag late in the Montana hunting season. Baldpates increased markedly in the composition of the bag from the Bitterroot Valley.

Ross's geese showed up in the bag for the first time since the checking stations have been operated. A total of 46 "white" geese were checked of which 10 or 22 percent were Ross's geese.

The bag check at Plentywood showed an interesting variation in the percent composition by species (Table 3). This was the only area that showed a species other than mallard contributing the greatest percentage to the total bag. Gadwall contributed 25.7 percent of the total bag during the first weekend in this area. The divers were also very important in the bag.

The average number of hunters per party was 2.1. During the first weekend, the average bag per hunter was 1.73 birds. The figures making up

this average varied from 2.0 birds per hunter at Plentywood to 1.1 birds per hunter at Grass Valley near Missoula.

The average number of trips to the field by each duck hunter was determined from postal card questionnaires as 1.9. (Table 4). The number of ducks per day reported by people receiving postal cards checks, within reasonable limits, with the same information gathered at checking stations. This tends to validate the data from these postal cards. However, further study on postal card surveys is needed in Montana.

Sex ratios were taken, but only the mallards were examined in sufficient quantity to provide usable data. The number of males taken, per female bagged, increased as the season progressed in all areas except Great Falls (Table 5). By using total sex ratios for each checking period we get a steady increase in the number of males per female as the season progressed.

#### ANALYSIS AND RECOMMENDATIONS:

The present system of checking stations has been used during the past four hunting seasons. The species composition of the bag has been fairly well established at the checking station points. These checking stations should be continued in order to further verify the results that have been obtained. The major effort, however, should now be directed toward obtaining species composition of the bag in other habitat areas within the State.

The information on the seasonal bag of the average hunter has been sketchy in the past. A different approach with a postal card survey should be tried. The establishment of a sizeable list of waterfowl hunters which could be contacted each year is needed. This hunter list would be supplemented each season with new names to keep the information current and provide a hunter list of a workable size.

Sex ratios of waterfowl other than mallards need not be gathered. The number of birds handled in species other than mallard has not been sufficient to give any indication as to the sex ratio of the population.

The continuous hunting season should be used in Montana if the season is of fifty days or more. The split season should be used if the number of days for hunting is less than forty-five. The varied hunting conditions encountered in a state the size of Montana make this recommendation essential.

Submitted by Wynn Freeman                      Approved by Robert F. Cooney  
Date April 15, 1952

Note: Tables are on following pages.





Table 1. Yearly comparisons by percentages of the total season data obtained at the Flathead and the Bitterroot voluntary checking stations.

|                   | Bitterroot Station |      |      | Flathead Station |       |      |
|-------------------|--------------------|------|------|------------------|-------|------|
|                   | 1948               | 1949 | 1950 | 1948             | 1949  | 1951 |
| Mallard           | 83.5               | 75.3 | 79.0 | 60.9             | 57.1  | 49.5 |
| Gadwall           | 0.2                | 0.4  |      | 2.8              | 1.4   | 2.5  |
| Baldpate          | 5.3                | 4.0  | 5.5  | 12.9             | 16.1  | 14.2 |
| Pintail           | 0.7                | 2.9  | 2.5  | 4.3              | 4.3   | 6.0  |
| Green-winged teal | 4.2                | 10.7 | 7.7  | 4.1              | 5.5   | 13.4 |
| Blue-winged teal  | 0.9                | 0.6  | 1.1  | 1.6              | 1.9   | 3.9  |
| Shoveller         | 0.4                | 0.6  | 0.7  | 1.2              | 2.9   | 3.9  |
| Wood duck         | 3.5                | 0.9  | 1.5  |                  |       |      |
| Redhead           |                    | 0.4  | 0.1  | 5.1              | 2.0   | 2.3  |
| Ring-necked       | 0.2                | 0.6  |      | 0.4              | 0.2   |      |
| Canvasback        |                    | 0.3  |      | 0.4              |       | 1.1  |
| Scaup             | 0.2                | 0.4  | 0.4  | 2.5              | 2.1   | 2.5  |
| Golden-eye        | 0.4                |      | 0.6  | 2.0              | 1.6   | 0.7  |
| Bufflehead        | 0.2                | 0.4  | 0.1  | 1.4              | 0.6   | 0.4  |
| Ruddy             | 0.4                | 1.3  | 0.1  | 0.1              | 0.1   | 0.6  |
| Unidentified      |                    | 1.0  | 0.2  |                  |       |      |
| Canada Goose      |                    | 0.3  | 0.2  |                  | 2.8   | 1.0  |
| Snow Goose        |                    |      |      |                  |       | 0.1  |
| No. in Sample     | 549                | 698  | 808  | 899              | 1,007 | 943  |
| No. Hunters       | 460                | 549  | 504  | 814              | 715   | 563  |
| Birds/Hunter/Day  | 1.19               | 1.27 | 1.60 | 1.10             | 1.41  | 1.68 |



Table 2. A comparison of the hunters and birds checked by periods.

|             | % of Hunters Checked |               | % of Birds Checked |               |
|-------------|----------------------|---------------|--------------------|---------------|
|             | First Day            | First Weekend | First Day          | First Weekend |
| Great Falls | 7.4                  | 29.8          | 22.7               | 65.8          |
| Bitterroot  | 23.2                 | 52.1          | 33.6               | 46.5          |
| Flathead    | 12.0                 | 43.5          | 17.5               | 47.5          |
| Freezout    | 15.6                 | 39.7          | 37.6               | 57.0          |
| Total       | 11.4                 | 37.7          | 21.6               | 53.3          |

Table 3. The percentage species composition of the hunters' bag of waterfowl by checking station area.

|                     | Flat-<br>head | Bitter-<br>root | Black-<br>foot | Great<br>Falls | *Grass<br>Valley | *Plenty-<br>wood | *Freez-<br>out Lake |
|---------------------|---------------|-----------------|----------------|----------------|------------------|------------------|---------------------|
| Mallard             | 48.5          | 70.6            | 62.6           | 49.5           | 63.6             | 21.2             | 39.9                |
| Pintail             | 5.8           | 2.8             | 2.7            | 8.3            | 2.3              | 1.9              | 12.6                |
| Gadwall             | 2.4           | 0.8             |                | 3.7            | 0.7              | 25.7             | 12.6                |
| Baldpate            | 14.2          | 11.0            | 12.2           | 6.1            | 2.3              | 4.8              | 4.1                 |
| Blue-winged teal    | 3.9           | 1.0             | 2.7            | 3.6            | 0.7              | 5.8              | 5.7                 |
| Green-winged teal   | 12.5          | 8.1             | 3.4            | 8.3            | 6.8              | 1.3              | 5.5                 |
| Shoveller           | 3.9           | 1.4             | 2.7            | 5.7            |                  | 11.9             | 9.4                 |
| Wood duck           |               | 1.0             |                |                | 3.0              |                  |                     |
| Redhead             | 2.2           |                 |                | 1.1            |                  | 10.6             | 1.6                 |
| Canvasback          | 1.1           | 0.2             | 2.0            | 1.8            |                  | 7.2              | T                   |
| Scaup               | 2.5           | 0.4             | 0.7            | 2.7            | 0.7              | 7.2              | 2.8                 |
| Buffle head         | 0.4           | 1.0             |                | 0.7            | 0.7              | 1.9              | 1.6                 |
| Ring-necked         |               | 0.2             | 2.7            | T              |                  |                  |                     |
| Golden-eye          | 0.7           | 0.2             | 4.1            | 0.9            |                  | 0.3              | 1.8                 |
| Ruddy               | 0.6           | 0.4             |                | 0.7            |                  | 0.3              | 0.9                 |
| White-winged scoter | T             |                 |                |                |                  |                  |                     |
| Merganser           | T             | 0.2             |                | T              |                  |                  |                     |
| Coot                |               |                 |                | 1.3            |                  |                  |                     |
| Canada goose        | 1.9           |                 |                |                |                  |                  | T                   |
| White fronted goose |               |                 |                | T              |                  |                  |                     |
| Blue goose          |               |                 | 0.7            |                |                  |                  |                     |
| Snow goose          | T             |                 |                | 1.3            |                  |                  | 6.2                 |
| Ross goose          |               |                 |                | 0.4            |                  |                  | 1.4                 |
| Unidentified        |               |                 | 2.0            |                | 4.5              |                  |                     |
| Total Birds         | 947           | 493             | 147            | 703            | 132              | 377              | 436                 |

\*Opening weekend only.

Table 4. Information on the 1951 waterfowl hunting season obtained from postcard questionnaires.

| Area of Check      | Number<br>of<br>Hunters | Total<br>Hunter<br>Days | Days per<br>Hunter<br>for<br>Season | Total<br>Ducks<br>Bagged | Ducks per<br>Hunter<br>for<br>Season | Ducks per<br>Hunter<br>Day | Total<br>Geese<br>Bagged | Geese per<br>Hunter for<br>Season |
|--------------------|-------------------------|-------------------------|-------------------------------------|--------------------------|--------------------------------------|----------------------------|--------------------------|-----------------------------------|
| Great Falls        | 37                      | 157                     | 4.2                                 | 282                      | 7.6                                  | 1.8                        | 7                        | .18                               |
| Missoula           | 74                      | 495                     | 6.7                                 | 955                      | 12.9                                 | 1.9                        | 14                       | .19                               |
| Unweighted average |                         |                         | 5.5                                 |                          | 10.3                                 | 1.9                        |                          | .19                               |

Table 5. Sex ratio of mallards taken during the 1951 hunting season in Montana.

|             | Number of Males/100 Females |               |                | Total |
|-------------|-----------------------------|---------------|----------------|-------|
|             | First Day                   | First Weekend | Rest of Season |       |
| Great Falls | 179                         | 207           | 120            | 164   |
| Bitterroot  | 126                         | 114           | 150            | 132   |
| Blackfoot   | 48                          | 77            |                |       |
| Flathead    | 80                          | 123           | 121            | 121   |
| Plentywood  | 100                         | 97            |                |       |
| Freezout    | 55                          | 82            | 212            | 134   |
| Totals      | 96                          | 120           | 139            | 128   |

|             |                |
|-------------|----------------|
| STATE       | Montana        |
| PROJECT NO. | 41-R           |
| DATE        | April 15, 1952 |
| VOL.        | III NO. I      |

## FINAL PROGRESS REPORT

FOR

### SURVEYS AND INVESTIGATIONS PROJECTS

As Required by

### FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Hunter Harvest Determination

#### INTRODUCTION

Work on this project consisted of two activities. There were, first, a system of checking stations located in the most critical areas for the purpose of determining hunter take and in some instances to collect pertinent biological information. The second activity was a random questionnaire to determine the big game kill for the entire State.

#### BIG GAME QUESTIONNAIRE

Post card questionnaires, similar to the following sample, were sent to every twentieth license holder. These names were selected from the license book stubs in our office files.

There were returns from 55% which were analyzed. Using the figures on the antelope kill, which was known (all were killed on a permit basis and success was determined previously), it was figured that these returns were 26% higher than they should be. No explanation is offered for this--perhaps a natural tendency towards exaggeration. The kill figures were therefore cut that amount.

It was learned that returns for figures on fawn or calf kills are unreliable as proven by actual checks in the field.



# HUNTER REPORT OF BIG GAME KILL

I killed the following big game animals:  
(Please check proper spaces)

| Species           | Male | Female | Young | County of Kill |
|-------------------|------|--------|-------|----------------|
| Mule Deer         |      |        |       |                |
| White-tailed Deer |      |        |       |                |
| Elk               |      |        |       |                |
| Moose             |      |        |       |                |
| Antelope          |      |        |       |                |
| Bear              |      |        |       |                |

I hunted big game but was not successful

I did not hunt big game

Name \_\_\_\_\_

Following is a compilation of data from card returns.

1951 - 52

## HUNTER KILL CARD RETURN

5% Sample

Total Number Hunters - 98,865

55% Return of 4,700 Cards Sent

| Species               | Male | Female | Young | Total | No. Killed | - 26% | % of Total Kill |
|-----------------------|------|--------|-------|-------|------------|-------|-----------------|
| Mule Deer             | 949  | 78     | 3     | 1030  | 39655      | 29345 | 49.00           |
| White-tailed Deer     | 283  | 55     | 1     | 339   | 13051      | 9658  | 16.00           |
| Elk                   | 203  | 161    | 15    | 379   | 14592      | 10789 | 18.00           |
| Antelope              | 195  | 88     | 4     | 287   | 11050      | 8177  | 14.00           |
| Moose                 |      |        |       | 3     | 116        | 86    | .14             |
| Black Bear            |      |        |       | 26    | 1001       | 741   | 1.20            |
| Grizzly Bear          |      |        |       | 0     | 25         | 25    | .04             |
| Goat                  |      |        |       | 1     | 39         | 39    | .07             |
| Total Big Game Killed | 1630 | 382    | 23    | 2065  | 79528      | 59870 |                 |

|                         | Percent | Total | Factor x 38.5               |
|-------------------------|---------|-------|-----------------------------|
| Did not Hunt            | 5.4%    | 139   | 5351                        |
| Hunted but Unsuccessful | 33.     | 849   | 32687                       |
| Killed One Animal       | 45.     | 1160  | 44660                       |
| Killed Two Animals      | 14.     | 358   | 13783                       |
| Killed Three Animals    | 2.3     | 59    | 2272                        |
| Killed Four Animals     | .11     | 3     | 116                         |
| Total Card Returns      |         | 2568  | 98868                       |
|                         |         |       | Big Game Li-<br>censes Sold |

## CHECKING STATIONS

There were twenty-five checking stations operated in big game areas. Standardized data sheets were kept on which were recorded kill by species and other pertinent data to be used in management.

Where convenient lower jaws and female reproductive tracts were collected for later examination. From this information herd productivity and history can be determined.

In several areas such as the Fisher-Wolf Creek and Fish Creek areas a full time check was not kept but hunters checked only during the three-day either sex deer season and mainly for the purpose of collecting biological data.

### SUMMARY OF ALL CHECKING STATIONS

| Area                             | Total<br>Elk | Total White-<br>tailed Deer | Total Mule<br>Deer | Remarks                                    |
|----------------------------------|--------------|-----------------------------|--------------------|--|
| Island Lake (3)                  |              | 84                          | 3                  | See Dec. 1951 Quar-<br>terly (1-R Western) |
| Nine Mile                        |              | 78                          | 1                  | " "  |
| Fish Creek                       |              | 33                          | 36                 | " "  |
| - - - - -                        |              |                             |                    |  |
| Thompson River                   | 4            | 125                         | 16                 |  |
| South Fork Flathead<br>(Coram)   | 549          | 16                          | 13                 |  |
| Swan Lake                        | 13           | 91                          |                    |  |
| Blackfoot<br>(Bonner-Clearwater) | 226          | 296                         | 173                | See Dec. 1951 Quar-<br>terly (1-R Western) |
| Sun River (3)                    | 805          | 45                          | 1028               |  |
| Big Hole (2)                     | 81           |                             | 519                |  |
| Gallatin (2)                     | 941          |                             | 274                |  |
| Yellowstone (Corwin)             | 2750         |                             | 2                  |  |
| Judith River (Utica)             | 43           |                             | 383                | Elk season extended<br>but not checked     |
| Ruby                             | 7            |                             | 595                |  |
| Ennis                            | 42           |                             | 237                |  |
| Nye                              |              |                             | 468                |  |
| Landusky                         |              |                             | 76                 | See Dec. 1951 Quar-<br>terly (1-R Eastern) |
| Matador                          |              | 44                          | 320                | " "  |
| Wilder (Roy)                     |              | 33                          | 324                | " "  |

For management of elk the Continental Unit has been devised, comprising the Sun River, South and Middle Forks of the Flathead and Swan River. There were 2018 elk, 82 goats, 60 black bear and 29 grizzly bear harvested.

FINAL REPORT  
of  
Thompson River Checking Station  
for 1951

Personnel: Robert L. Freer  
Mrs. R. L. Freer

Dates of Season: October 15 to November 15

TOTAL GAME KILL - 1951 (148)

| <u>Species</u>    | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u>    | <u>Total</u> |
|-------------------|-----------------------|-------------------------|-----------------------|-------------------------|------------------|--------------|
| Elk               | 4                     |                         |                       |                         |                  | 4            |
| Mule deer         | 15                    |                         | 1                     |                         |                  | 16           |
| White-tailed deer | 54                    | 49                      | 6                     | 9                       | 7                | 125          |
| Black bear        |                       | 1                       | 1                     |                         | 1(year-<br>ling) | 3            |

Number of Successful hunters checked - 148

Number of Unsuccessful hunters checked - 138

Estimated percentage of hunters who were checked - 60 - 80%



FINAL REPORT  
of  
Coram Checking Station  
for 1951

Personnel: Jay Penny

Dates of Season: October 18 to November 16

TOTAL GAME KILL - 1951 (521)

| <u>Species</u>    | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|-------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk               | 153                   | 214                     | 35                    | 58                      | 24            | 484          |
| Mule deer         | 10                    | 3                       |                       |                         |               | 13           |
| White-tailed deer | 12                    | 4                       |                       |                         |               | 16           |
| Black bear        | 5                     |                         |                       |                         |               | 5            |
| Grizzly bear      |                       | 1                       |                       |                         |               | 1            |
| Mountain goat     | 1                     |                         | 1                     |                         |               | 2            |

Number of Successful hunters checked - 521

Number of Unsuccessful hunters checked - 1995

Estimated percentage of hunters who were checked - 90%

Remark: There was an estimate of 65 elk that were not checked before October 18, 1951, which will make a total of 549 elk.





FINAL REPORT

of

Swan Lake Checking Station

for 1951

Personnel: Frank A. Stefanich  
Herb York

Dates of Season: November 12 - 15

TOTAL GAME KILL - 1951 (104)

| <u>Species</u>    | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|-------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk               |                       | 9                       | 1                     | 3                       |               | 13           |
| White-tailed deer | 35                    | 36                      | 10                    | 10                      |               | 91           |

Number of Successful hunters checked - 97

Number of Unsuccessful hunters checked - 337

Estimated percentage of hunters who were checked - 90%

Remark: This station was operated primarily to determine deer take during either sex hunt. See 1-R-11 Western Quarterly Report for December 1951 for further details.



FINAL REPORT  
of  
Bonner-Clearwater Checking Station  
for 1951

Personnel: Frank A. Gummer  
George B. Chaffee

Dates of Season: October 15 - November 15  
(Antlerless deer - November 13, 14 & 15)

TOTAL GAME KILL - 1951 (703)

| <u>Species</u>    | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|-------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk               | 100                   | 85                      | 13                    | 16                      | 12            | 226          |
| Mule deer         | 158                   | 2                       |                       | 1                       | 12            | 173          |
| White-tailed deer | 207                   | 40                      | 5                     | 7                       | 37            | 296          |
| Black bear        | 4                     | 4                       |                       |                         |               | 8            |

Number of Successful hunters checked - 684

Number of Unsuccessful hunters checked - 1953

- Estimated percentage of hunters who were checked - 50%

Remark: See 1-R-11 Western Quarterly Report for December 1951 for further details on either sex deer hunt data.





FINAL REPORT  
of  
Sun River Checking Station  
for 1951

Personnel:        Dave Stonehouse  
                    Jim McLucas  
                    Bob Fischer

Dates of Season:    October 13 - November 21

TOTAL GAME KILL - 1951    (1663)

| <u>Species</u>    | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|-------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk               | 143                   | 233                     | 45                    | 60                      | 64            | 545          |
| Mule deer         | 547                   | 161                     | 197                   | 100                     | 23            | 1028         |
| White-tailed deer | 42                    | 1                       | 1                     | 1                       |               | 45           |
| Black bear        | 6                     |                         | 1                     |                         |               | 7            |
| Grizzly bear      | 3                     |                         |                       |                         |               | 3            |
| Mountain goat     |                       |                         |                       |                         |               | 35           |

Number of Successful hunters checked - 1525

Number of Unsuccessful hunters checked - 3177

Estimated percentage of hunters who were checked - 85%

Remark: This is a combined report of the Sun River, Elk Creek and Benchmark stations. It was estimated locally that the total kill, including early unchecked kills from upper Flathead and others not checked, amounted to 805 elk.



FINAL REPORT  
of  
Mill Creek Checking Station  
for 1951

Personnel: M. M. Critchfield

Dates of Season: October 15 - November 17

TOTAL GAME KILL - 1951 (273)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            | 27                    | 4                       | 4                     | 1                       | 2             | 38           |
| Mule deer      | 114                   | 73                      | 11                    | 14                      | 12            | 224          |
| Black bear     | 2                     |                         |                       |                         |               | 2            |
| Moose          | 9                     |                         |                       |                         |               | 9            |

Number of Successful hunters checked - 275

Number of Unsuccessful hunters checked - 2648

Estimated percentage of hunters who were checked - 95%



FINAL REPORT  
of  
Divide Checking Station  
for 1951

Personnel: Wm. G. Keller

Dates of Season: October 15 - November 17

TOTAL GAME KILL - 1951 (349)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            |                       |                         |                       |                         |               | 43           |
| Mule deer      |                       |                         |                       |                         |               | 295          |
| Moose          |                       |                         |                       |                         |               | 10           |
| Black bear     |                       |                         |                       |                         |               | 1            |

Number of Successful hunters checked - 349

Number of Unsuccessful hunters checked - 3619

Estimated percentage of hunters who were checked - 95%





FINAL REPORT  
of  
Grayling Creek Checking Station  
for 1951

Personnel: Dale H. Nuss - Deputy Game Warden  
Harold Estey - Park Ranger  
Paul V. Wykert - Park Ranger  
Harry Reynolds - Park Ranger

Dates of Season: October 15 to November 15

TOTAL GAME KILL - 1951 (72)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            | 11                    | 14                      | 3                     | 6                       | 6             | 40           |
| Mule deer      | 24                    | 2                       | 4                     |                         | 1             | 31           |
| Moose          | 1                     |                         |                       |                         |               | 1            |

Number of Successful hunters checked - 64

Number of Unsuccessful hunters checked - 369

Estimated percentage of hunters who were checked - 75%



FINAL REPORT  
of  
Squaw Creek Checking Station  
for 1951

Personnel:       Norman Wortman  
                  Sam Alford  
                  Irvin Poynter  
                  Tom Allabaugh

Dates of Season:   October 15 - November 15 on Deer, Bear and Moose  
                  October 15 - November 9 on Elk

TOTAL GAME KILL - 1951 (1119)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            | 192                   | 417                     | 83                    | 96                      | 68            | 856          |
| Mule deer      | 192                   | 2                       |                       |                         | 49            | 243          |
| Black bear     | 2                     | 4                       |                       | 4                       |               | 10           |
| Moose          | 9                     |                         | 1                     |                         |               | 10           |

Number of Successful hunters checked - 1028

Number of Unsuccessful hunters checked - 9299

Estimated percentage of hunters who were checked - 95%

|                              |           |
|------------------------------|-----------|
| Remark: Squaw Creek Station  | 856       |
| Grayling Creek Station       | 40        |
| Cripples and misc.           | <u>45</u> |
| Final take from the Gallatin |           |
| Herd estimated to be         | 941       |





FINAL REPORT  
of  
Corwin Springs Checking Station  
for 1951

Personnel:        Jack Waynard  
                  Norman Wortman  
                  Tom Allabaugh

Dates of Season:    November 20, 1951 - January 31, 1952

TOTAL GAME KILL - 1951    (2,752)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            | 673                   | 1489                    | 151                   | 213                     | 224           | 2750         |
| Mule deer      |                       | 1                       |                       | 1                       |               | 2            |

Number of Successful hunters checked - 2750

Number of Unsuccessful hunters checked - 6528

Estimated percentage of hunters who were checked - 90%



FINAL REPORT  
of  
Utica Checking Station  
for 1951

Personnel:           W. L. Peters  
                      Harry F. Welch

Dates of Season:    October 15 - November 18

TOTAL GAME KILL - 1951   (388)

| <u>Species</u>    | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|-------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk               | 37                    | 6                       |                       |                         |               | 43           |
| Mule deer         | 112                   | 4                       | 205                   |                         | 62            | 383          |
| White-tailed deer | 1                     |                         |                       |                         |               | 1            |
| Black bear        |                       | 1                       |                       |                         |               | 1            |
| Moose             | 1                     |                         |                       |                         |               | 1            |

Number of Successful hunters checked - 435

Number of Unsuccessful hunters checked - 1850

Estimated percentage of hunters who were checked - 95%



FINAL REPORT  
of  
RUBY CHECKING STATION  
for 1951

Personnel:       Anthony F. Geis  
                  August A. Schroeder

Dates of Season:   October 15 - November 15

TOTAL GAME KILL - 1951   (602)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            | 1                     | 5                       |                       | 1                       |               | 7            |
| Mule deer      | 247                   | 175                     | 92                    | 81                      |               | 595          |

Number of Successful hunters checked - 602

Number of Unsuccessful hunters checked - 1462

Estimated percentage of hunters who were checked - 98%





FINAL REPORT  
of  
Ennis Checking Station  
for 1951

Personnel: Heisey  
Combs

Dates of Season: October 15 - November 15

TOTAL GAME KILL - 1951 (279)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            | 18                    | 20                      | 2                     | 2                       |               | 42           |
| Mule deer      | 103                   | 79                      | 23                    | 29                      | 3             | 237          |

Number of Successful hunters checked - 279

Number of Unsuccessful hunters checked - Unknown

Estimated percentage of hunters who were checked - 50%



FINAL REPORT  
of  
Nye Checking Station  
for 1951

Personnel: Otto E. Kebschull  
John Gustafson  
Arnold Lien  
Grant Smith  
Henry Bedford

Dates of Season: November 1 - November 7

TOTAL GAME KILL - 1951 (468)

| <u>Species</u> | <u>Adult<br/>male</u> | <u>Adult<br/>female</u> | <u>Young<br/>male</u> | <u>Young<br/>female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Elk            | 90                    | 220                     | 59                    | 82                      | 17            | 468          |

Number of Successful hunters checked - 468

Number of Unsuccessful hunters checked - 1065

Estimated percentage of hunters who were checked - 95%



FINAL REPORT

of

Landusky Checking Station

Personnel: Ray C. Leivsay  
Bernard Majusiak

Dates of Season: October 15 to October 21, inclusive.

TOTAL GAME KILL - 1951 (76)

| <u>Species</u> | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|----------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Mule deer      | 23                    |                         | 41                    |                         | 12            | 76           |

Number of Successful hunters checked - 76

Number of Unsuccessful hunters checked - 90

Estimated percentage of hunters who were checked - 99%





FINAL REPORT  
of  
Matador Checking Station  
1951

Personnel: Purl Seibert  
Arnold Hasty

Dates of Season: October 12 - October 21

TOTAL GAME KILL - 1951 (351)

| <u>Species</u>    | <u>Adult<br/>Male</u> | <u>Adult<br/>Female</u> | <u>Young<br/>Male</u> | <u>Young<br/>Female</u> | <u>Spikes</u> | <u>Total</u> |
|-------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------|--------------|
| Mule deer         | 124                   |                         | 163                   |                         | 12            | 309          |
| White-tailed deer | 26                    |                         | 16                    |                         | 2             | 42           |

Number of Successful hunters checked - 364

Number of Unsuccessful hunters checked - 522

Estimated percentage of hunters who were checked - 98%

Submitted by:

Name Faye M. Cooney

Title Big Game and Lands Biologist

Approved by:

Montana State Department of Fish & Game

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952



|             |                |
|-------------|----------------|
| STATE       | Montana        |
| PROJECT NO. | W-49-R-1       |
| DATE        | April 15, 1952 |
| VOL.        | III            |
| NO.         | I              |

QUARTERLY PROGRESS REPORT FOR  
INVESTIGATIONS PROJECTS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Fur Resources Survey and Investigation
2. Leader: Fletcher E. Newby, Jr. Biologist
3. Report of Progress:

WORK PLAN NO. I      JOB NO. I

TITLE: SURVEY OF FUR ANIMAL DISTRIBUTION AND HABITAT

Investigation of wolverine distribution based on sight and capture records is nearly complete. The present range of the wolverine in Montana appears to be the northern portion of the Continental Divide and associated ranges. Although not common, this animal is more numerous in this area than is widely realized.

Considerable information on the distribution of otter was gathered. They are considered common in local areas in Lincoln county but elsewhere they occur only in low numbers on most of the larger streams in western Montana.

Field work in muskrat marsh areas was continued during the quarter. Checks for outbreaks of epizootic diseases, the effects of water level fluctuations and population estimates were items receiving special emphasis.

Research into the historical status of marten distribution was conducted by means of interviews with "old-timers" and other local residents with the aim of locating areas where marten once occurred and where suitable habitat is still present. Areas which have been defined will be investigated during the summer.



WORK PLAN NO. I      JOB NO. II

TITLE: FUR RESOURCE INVENTORY

Information on the value and take of furs for the 1950-51 trapping season is nearly complete. All but a few fur dealers have been contacted and their records obtained. Examination of beaver tagging records and shipping permits will complete these data and a final report will be submitted in the next quarterly report.

Trapper catch report cards have been prepared and these are to be sent to the trappers at the end of the current season.

Submitted by:

Approved by:

Name Fletcher E. Newby

Montana State Department of Fish and Game

Title Junior Biologist

By Robert F. Cooney, Director

Title Wildlife Restoration Division

Date April 15, 1952





|         |                |
|---------|----------------|
| STATE   | Montana        |
| PROJECT | 5-D-10         |
| DATE    | April 15, 1952 |
| VOL.    | III NO. I      |

QUARTERLY PROGRESS REPORT FOR  
DEVELOPMENT PROJECTS

As Required by  
FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: General Wildlife Restocking
2. Leader: James McLucas, Fieldman
3. Report of Progress:

ANTELOPE TRAPPING AND TRANSPLANTING

Broadwater County

Winter 1952

DATE:

March 16, 1952 to March 22, 1952

PERSONNEL:

James McLucas, Leader  
Department personnel as was available

PURPOSE:

To transplant in areas where antelope were historical. Transplants will also be made to reinforce areas stocked last year.

PROCEDURE:

On March 15 through March 18, the antelope trap was set up by Department personnel who were available. It was put into operation on March 19, when 101 antelope were trapped in approximately one hour of flying time.

The following day, 30 antelope were tagged, sexed, loaded and

transported to Cedar Creek, Madison County, where they were released. On the following day, 30 antelope were loaded and transported north of Gregson Springs, Silver Bow County. On the same day, 10 antelope were tagged and taken to the Moiese Bison Range for release. The remaining 25 antelope were loaded and taken to Indian Creek, Madison County for release.

This concluded the antelope trapping for this period with 101 antelope taken. Six antelope were lost in the trapping operation and none were lost in transportation.

#### RESULTS:

The following tabulations are the results of this year's antelope trapping:

| Date                                      | Area Released         | Antelope Condition | Release Area Condition | Doe Fawn | Buck Fawn | Buck Doe |
|---|-----------------------|--------------------|------------------------|----------|-----------|----------|
| <u>Madison County, Cedar Creek</u>        |                       |                    |                        |          |           |          |
| March 19                                  | Cedar Creek           | Good               | Good                   | 7        | 8         | 4 11     |
| <u>Madison County, Indian Creek</u>       |                       |                    |                        |          |           |          |
| March 21                                  | Indian Creek          | Good               | Good                   | 8        | 0         | 5 12     |
| <u>Silver Bow County, Gregson Springs</u> |                       |                    |                        |          |           |          |
| March 20                                  | Gregson Springs       | Good               | Good                   | 12       | 0         | 5 13     |
| <u>Moiese Bison Range</u>                 |                       |                    |                        |          |           |          |
| March 20                                  | Moiese<br>Bison Range | Good               | Good                   | 1        | 9         |          |
| Grand Total                               |                       |                    |                        | 28       | 17        | 14 36    |
| Total Antelope                            |                       |                    |                        | 95       |           |          |

#### MAINTENANCE:

Due to a spring snow, it was several days before the antelope trap could be taken down. It was then found that three day's work were necessary to put it in first class shape before it was stored away.

Submitted by:

Name James McLucas

Title Fieldman

Approved by:

Montana State Department of Fish and Game

By Robert F. Cooney, Director

Title Wildlife Restoration Division

Date April 15, 1952

|             |                |
|-------------|----------------|
| STATE       | Montana        |
| PROJECT NO. | 33-D-3         |
| DATE        | April 15, 1952 |
| VOL. III    | NO. I          |

QUARTERLY PROGRESS REPORT FOR  
DEVELOPMENT PROJECTS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Blackfoot-Clearwater Winter Big Game Range Development
2. Leader: Stan Mongrain, Unit Manager

Personnel: Jack Ray, Junior Fieldman  
Al Mullenax, Laborer  
Frank Gummer, Fieldman

3. Report of Progress:

JOB 5      PORTABLE ELK TRAP CONSTRUCTION

A trip to Jackson, Wyoming by Bob Cooney, Faye Couey, Joe Gaab, and myself to view the type traps Wyoming used, furnished the basic ideas for a portable trap built here in Montana.

Speed of construction, ease of hauling and setting up were determining factors in the selection of material used in building the trap.

Enough rough lumber was purchased to build one trap. The panels for the trap proper, gates, and tagging chute were made of 1 x 6 rough. The panels are nine feet high and seven feet wide. These panels are easy to handle and load flat on a truck. The gates are made seven feet wide and seven feet high. They set in a frame nine feet high and seven and one-half feet wide. The gate frames are of 6" x 6" uprights with 2 x 6 across the top and bottom. The bottom 2 x 6 extends beyond the uprights one foot on each side. Another 2 x 6 at right angles to the one across the bottom forms a base to prevent tipping when the gate swings.

The panels are set in a circle wired together top and bottom with one strand of number 9 wire. This is necessary to hold the panels in place while setting up the trap.

The trap is held together by four cables 130 feet long. These

cables are stretched around the top and bottom of the trap. Eight guy cables are put up from the top of the trap out to steel pins driven into the ground. These cables eliminate most of the sway in the trap.

Three men can build a complete trap in two weeks. The trap can be set up, ready to trap, in two days by three men.

Submitted by:

Approved by:

Name Stan Mongrain

Montana State Department of Fish and Game

Title Unit Manager

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952

|             |                |
|-------------|----------------|
| STATE       | Montana        |
| PROJECT NO. | 45-M           |
| DATE        | April 15, 1952 |
| VOL.        | III NO. I      |

QUARTERLY PROGRESS REPORT FOR

MAINTENANCE PROJECTS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Blackfoot-Clearwater Big Game Range
2. Leader: Stan Mongrain, Unit Manager

Personnel: Jack Ray, Junior Fieldman  
Al Mullenax, Laborer  
Frank Gummer, Fieldman

3. Report of Progress:

GAME BAITING AND MIGRATION CONTROL

In the winters of 1949 and '50, 1950 and '51, long experimental lines of feed were put out from the border of Blackfoot-Clearwater Range onto private lands. These feed lines were for the purpose of determining the possibility of establishing a definite pattern of travel for the elk coming from the high country onto winter range within the acquisition area.

The first winter a line was run north from Blackfoot-Clearwater Range for three and one-half miles. Another line was run north and east for three miles. These bait lines attracted the elk that formerly stayed in the lower fringe of heavy timber bordering Blackfoot-Clearwater Range. The elk followed these lines onto Department owned winter range where part of them spread over the range utilizing natural forage, while some had to be fed in order to hold them.

In the winter of 1950-51, the line running north and east from the Blackfoot-Clearwater Range was extended four and one-half miles, or a total of seven and one-half miles. This line reached to the lower edge of the summer range. This line was maintained for two and one-half months. An estimated three hundred elk were noted along this line during the winter. The attempt to move these along this line was not successful. The elk would follow the feed for a distance but would not cross the county road onto Department range. This line did hold the elk north of the ranches



while this line was maintained.

Another attempt to pull the elk through this area was decided upon for this winter. After the hunting season, the elk began to move into this area. When deep snow forced them to concentrate along the feed line route, hay was taken from headquarters and scattered in a long line from the border of Department range north and east to Monture Ranger Station. After two days of feeding along this long line, the feed line was shortened better than half its length. The elk followed this line onto Department range, some crossing the county road the third night after the start of the feed line. One week of maintaining this feed line was all that was necessary to pull all the elk in the vicinity onto the Blackfoot-Clearwater Range.

A short feed line has been necessary this winter, mainly as a holding measure to prevent elk straggling to the range, from drifting onto neighboring ranches during the severe winter period.

#### SNOW PLOWING

The snow fall for this winter was more than average. Very little wind accompanied each snow storm. Keeping the roads open and passable did not require the plowing expected at the beginning of the winter. About seventy hours was spent in opening roads and clearing trapping sites.

Submitted by:

Approved by:

Name Stan Mongrain

Montana State Department of Fish & Game

Title Unit Manager

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952



|         |                |
|---------|----------------|
| STATE   | Montana        |
| PROJECT | 47-M           |
| DATE    | April 15, 1952 |
| VOL.    | III NO. I      |

QUARTERLY PROGRESS REPORT FOR

MAINTENANCE PROJECTS

As Required by

FEDERAL AID IN FISH AND WILDLIFE RESTORATION ACTS

1. Title of Project: Maintenance of Sun River Winter Elk Range Development
2. Leader: Bruce Neal, Unit Manager
3. Report of Progress:

ELK HERDING PATROL -- ELK TRAPPING

DATE: January - March, 1952

PERSONNEL: Bruce Neal, Unit Manager  
Robert Neal, Assistant  
Robert Fischer, Fieldman  
Dan Neal  
Dave Stonehouse

TITLE: Elk Herding Patrol

PURPOSE: This patrol was used to drift the elk from private land onto the game range.

PROCEDURE:

There were four camps placed along the area covered. The front of activity was approximately twenty-eight to thirty miles long. One man worked from each camp. He had two saddle horses with which he drifted the elk from his sector to the other until they were on the range. A rifle was used in this work to scare the animals along.

It was possible to drift approximately two thousand head of elk onto the game range in this manner.

TITLE: ELK TRAPPING

A portable elk trap built on the same design as the one used on the Blackfoot-Clearwater Game Range was set up on the Sun River Game Range. It was found that this trap would not withstand the terrific winds encountered here. Two elk were caught, tagged and released.

Submitted by:

Name Robert Neal

Title Fieldman

Approved by:

Montana State Department of Fish & Game

By Robert F. Cooney, Director

Wildlife Restoration Division

Date April 15, 1952



